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FACTORS INFLUENCING TOP-IT-MANAGERS WORK-RELATED ATTITUDES

DOCTORAL THESIS

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CONTENTS

LIST OF ABBREVIATIONS

CEO ..... *Chief Executive Officer*
CFO ..... *Chief Financial Officer*
CIO ..... *chief information officer / executive IT manager*
C-level ..... high-ranking executive titles in an organization
DACH ..... *Region consisting of Germany, Austria and Switzerland*
ESCO ..... *European skills/competences, qualifications and occupations framework*
PDCA ..... *Plan – Do – Check – Act Cycle*

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ANNOTATION

The business world, acting in the digital transformation era, relies heavily on information technology. In a dynamic technological landscape marked by volatility, uncertainty, complexity, and ambiguity, top IT managers also called Chief Information Officers (CIO) play an important role, making sure technology aligns to digital transformation goals. This research looks into their various roles and performance-driving attitudes, analyzing factors influencing their attitudes based on the principal-agent theory, emphasizing its importance in management science.

This research examines gaps in the literature and examines how "moral hazard reduction measures" influence work motivation and job satisfaction of CIOs in German-speaking regions (Germany, Austria, Switzerland). It explores the relationship between information asymmetry, perceived mutual understanding with superiors, business-IT alignment and their influence on the motivation and job satisfaction of CIOs. The study also considers the moderating effects of trust and information technology knowledge.

To achieve these goals, a multi-layered empirical approach was chosen. The CIO roles were validated using a comprehensive literature analysis and a structured content analysis of German job advertisements. Semi-structured expert interviews have provided insights into factors influencing top management attitudes. Both approaches, together with a literature review, provided the basis for the development of a theoretical research model. This research model examines which causal relationships exist between information asymmetry and moral hazard reduction measures and management attitudes. Everything taking moderating factors into account.

Findings from an empirical survey, utilizing validated questionnaires, align with the main hypothesis. Management instruments mitigating information asymmetry and reducing moral hazard significantly contribute to positive CIO attitudes.

This research enhances existing models and introduces novel factors and managerial measures moderating top-IT-managers attitudes. It opens possibilities for future research, especially for bonding-related measures, within management science.

Keywords: Moral hazard reduction measures, information asymmetry, work motivation, job satisfaction, Business IT alignment, trust, IT knowledge, principal-agent-theory, Chief information officer.

INTRODUCTION

In today's world, information technology is integral not just in our personal lives but notably in the business domain. Chief Information Officers (CIO or Top-IT-Managers) bear the responsibility of managing IT within organizations. The role contains various diverse tasks. As its main responsibility it oversees the organization's IT landscape at the same time considering external and internal influences.

Responding to dynamic factors, companies define missions and visions, and formulate strategies and business models. The Chief Executive Officers and Chief Financial Officers, along with other Top Management Team members, lead these strategic efforts, making critical decisions about products and services in various markets. The CIO plays an essential role in aligning business and IT, facilitating existing services, anticipating future trends, and exploring innovative digitally-enabled business models. A deep understanding of business processes and financial aspects is essential for IT executives. Therefore, a comprehensive education involving professional, academic, and on-the-job learning is important. Successful CIOs typically follow a career path that includes significant experience and tenure in their current position, as well as exposure to other operative business processes. The nature of CIO roles varies considerably due to differences among companies and the environments in which they operate. The spectrum of CIO roles ranges from being a "triage nurse & firefighter" to a "landscape cultivator," and from an "opportunity seeker" to an "innovator & creator." (Chun and Mooney, 2009, p. 329, Figure 4). The specific responsibilities within each of these roles differ and impact organizational performance. Importantly, the performance of an organization rests on the motivation and satisfaction of its leaders and managers. Employee commitment to their work and productivity is intrinsically tied to the motivation and job satisfaction of their superiors. Ineffective or demotivated management inevitably permeates the organizational hierarchy, resulting in poor or lacking performance.

Actuality of the topic

This study investigates factors influencing the attitudes of top IT managers towards work motivation and job satisfaction. It explores established human resources mechanisms, including Performance Management Systems and Monetary Incentive Systems, and delves into aspects such as perceived mutual understanding and business IT alignment to address information asymmetry between executive managers and CIOs. Trust moderates the relationship between principals and agents. The research intends to establish a significant connection between management factors and work-related attitudes, examining the correlation between HR tools

and individual drivers of motivation and satisfaction. Additionally, it explores the moderating role of trust in CIOs' relationships with supervisors and their supervisors' IT knowledge.

The problem addressed in this research from a management science perspective revolves around the interplay between interpersonal, managerial and organizational factors and their impact on the work-related attitudes, motivation, and job satisfaction of Chief Information Officers (CIOs) in German-speaking companies. By examining this complex relationship, the study attempts to to uncover the critical drivers to performance in IT leadership roles, contributing helpful insights to the field of management science.

Aim

The aim of this dissertation is to examine which, and to what extent, managerial and organizational factors have an impact on the performance-fostering work-related attitudes. Furthermore, the goal is to develop a novel model with practical recommendations for executive management and other stakeholders within organizations to cultivate positive work attitudes among top IT managers.

Tasks

The tasks to be undertaken in this thesis include:

1. To review literature on management and leadership, emphasizing the typology, spectrum, and antecedents of individual executive performance in IT organizations. Analyze applicable organizational theories for top IT managers and Chief Information Officers (CIOs).
2. To identify work-related attitudes as dependent variables through content analysis.
3. To identify principal-agent theory measures enhancing work-related attitudes of top IT managers, considering positive moderating factors.
4. To conduct semi-structured interviews with experts from various perspectives (owners association, workers association, suppliers, academia) on factors influencing top managers' work attitudes.
5. To statistically examine how principal-agent theory measures impact work-related attitudes of top IT managers in German-speaking companies.
6. To develop a model of factors and measures influencing work-related attitudes of Top-IT-managers.
7. To provide recommendations for practitioners and researchers in leadership and management. Suggest further research directions focusing on improving CIO attitudes by implementing measures to reduce information asymmetry and mitigate moral hazard.

Research object

Top IT managers (Chief Information Officers) working in companies in the DACH region which consists of the countries Germany, Austria, and Switzerland.

Research subject

Management factors influencing managerial attitudes, which contribute to the organizational success of top IT managers.

Research questions and hypotheses

The key research questions for this research are:

1. Which Principal Agent related problem reduction measures contribute to top IT manager attitudes?
2. Are there moderating effects, from hygiene factors, on the relationship between Principal Agent related problem reduction measures and top IT manager attitudes?

Derived from theses research questions, the main hypothesis of this dissertation is formulated as follows:

H_0: Management factors have an effect on the attitudes of top information technology managers

The research questions led to three main hypothesis H_A,H_B and H_C driving the overall research:

The first research question leads to the first summarizing hypothesis H_A:

H_A: Reduction measures of principal agent related problems have an impact on top IT manager attitudes.

Aligned with the first main hypothesis and the second research question mentioned above, the following additional propositions have been developed as a basis for all research and analysis:

Trust in the principal and the IT knowledge of the principal has an influence on the relationship described in the first main hypothesis H_A.

Both propositions lead to the second and third summarizing hypotheses H_B and H_C.

H_B: Agent trust in principle has a moderating effect on the association between principal agent related problem reduction measures and top IT manager attitudes.

H_C: Principals' IT knowledge has a moderating effect on the association between principal agent related problem reduction measures and top IT manager attitudes.

Besides the test of the main hypotheses, it is tested whether work motivation has an effect on job satisfaction.

Hypothesis 5 (H5):

A high level of work motivation will positively affect top IT manager job satisfaction

Thesis for defense

1. Top IT managers' work attitudes are directly influenced by a combination of factors, including information asymmetry reducing measures between principals and agents, as well as procedural aspects within organizations.
2. Additionally, moral hazard reduction measures positively impact the work attitudes of top IT managers, with the level of trust they have in their supervisors playing a significant role in certain cases.
3. Furthermore, the research suggests that information asymmetry reduction measures have a more substantial impact on job satisfaction compared to work motivation.

Novelty of research

Scientific novelties:

1. Development of a research model of the information asymmetry and adaptation of moral hazard reduction measures towards CIO attitudes.
2. Identification of agent trust in the principal, moderating the association between the performance management system and work motivation.
3. Identification of agent trust in the principal, moderating the association between the monetary incentive system and job satisfaction.

Practical novelties:

4. Top executives can improve work motivation and job satisfaction of their direct reports by trust building behaviors and actions
5. For organizations, the trust level, a top manager has in his supervising executive manager, can compensate for the missing positive effect of the existence of a performance management system on work motivation.
6. For top level managers with near to full trust in their executive manager the effect of a well-managed incentive system on job satisfaction is irrelevant. On the other hand: if the trust in the direct supervisor is not at the highest level, a well-functioning monetary incentive system can compensate the effects on job satisfaction.

Content and structure of the dissertation

This dissertation comprises five sections. The introductory part discusses the significance of the topic for management science, presenting hypotheses, research questions, limitations, and the aim of the dissertation. Chapter one explores the theoretical framework, emphasizing volatility, uncertainty, complexity, and ambiguity as challenges. The CIO's role evolution, challenges, and theoretical models are discussed, concluding with the impact of work motivation and job satisfaction on organizational performance.

Chapter two identifies influencing factors on CIO attitudes, using quantitative approaches and expert interviews. Factors are categorized into information asymmetry, moral hazard reduction, CIO attitudes, hygiene factors, and organizational influences. Literature findings are validated through expert interviews, providing a comprehensive understanding.

The third chapter outlines the empirical investigation in the DACH region, detailing research methods, constructs, data acquisition, and descriptive statistics. Hypotheses derivation, research model, and statistical analysis process are presented. The conclusion section systematically analyzes and compares findings, offering suggestions.

Methodology

Throughout the dissertation, the empirical mixed method research method is used with different sources and methodology. For chapter 1, the collection and analysis of quantitative data utilizing literature research and internet content is applied. In chapter 2, the context of previous research is analyzed and enriched by structured content analysis of job advertisements and a semi-structured in-depth interview of seven experts. This chapter combines both qualitative and quantitative data collections and analysis methods. The accumulated knowledge and insights from the first and second chapter are then used to design a research model and hypotheses to be tested in chapter three for quantitative data collection by utilizing an online survey. The obtained data is then statistically analyzed using IBM SPSS and conclusions and suggestions are presented.

Scientific library databases such as Science Direct, Web of Science, Ebsco, ResearchGate, Google Scholar, and Academia were used to do structured and explorative literature searches.

As the target group from the online survey all companies with >125 Mio€ (N=7471) were chosen. Overall N=3356 contact attempts across various channels were initiated resulting in 300 started survey, whereof N=168 surveys were completely filled and used for statistical analysis in IBM SPSS 22 (IBM Corp.).

Similarly, earlier surveys of scholars in the same target group and region suggest that the results can be regarded as valid after comparing the demographic descriptive statistics.

Primary literature by authors such as Park (Park, 2010, pp. 403–437), Termer (Termer, 2015, pp. 148–150), Podsakov (Podsakoff et al., 1990, pp. 113–115), and Durst (Durst, 2007, pp 4-5, pp 18-20, pp 113-115) on the CIO role is embedded in this dissertation and contemporary scientific research on comparable previous research on the topic is investigated. This dissertation includes secondary and primary research methods. It was executed by involving various qualitative methods (content analysis) and quantitative methods (survey questionnaire, grouping, comparisons, frequency analysis, text mining, rankings, descriptive statistical analysis, correlation analysis, and cluster analysis).

Limitations

The general view on the research in the area of the principal agent theory as that it is an instrument to analyze the research subject management instruments and that its impact on the job attitudes of top executives implies a huge field of research. To focus this dissertation, the topic was narrowed down to two IT-specific information asymmetry reduction measures and two moral hazard reduction measures and CIOs as top executives of companies. The research solely focuses on companies from the DACH region and is limited to the years 2017 to 2022.
Statistical Limitations: Limitations result from the sample size achieved. The sample compiled with 162 (complete) data sets can be considered very satisfactory and is able to be referred to.
Furthermore, the data might be limited in terms of representativeness due to the data collection process of an online survey and the self-selection of the participants. Therefore, the results can only be explained in an exploratory way. Transferability to other countries/regions/settings might be limited.

Approbation of results of research (publications, conferences, others)

The main results have been provided to the scientific community for use and future research.
The approbation of the research was presented and discussed in 12 scientific publications and 14 scientific conferences (in Riga, Oxford, Paris, Dublin, Berlin, Budapest, Amsterdam, Würzburg, Athens and online).

Publications

Papers have been published in conference proceedings and in journals.

1. Roscher, Bjarne Erik: Formal Training of IT Managers in Germany: Research based on Job Advertisements., in Conference proceedings of 2nd International Conference on Research in Business, Management and Finance (ICRBMF), Oxford, United Kingdom, March 27th-29th, 2020, DOI: 10.33422/2nd.icrbmf.2020.03.110, (EBSCO)
2. Roscher, Bjarne Erik; Brink Norbert G.: Tasks of IT Managers: Empirical Research Based on Job Advertisements in Germany., in Conference proceedings of 3rd

International Conference on Applied Research in Management, Economics and Accounting (IARMEA), Paris, France, November 20th-22nd, 2020, DOI: 10.33422/3rd.iarmea.2020.11.121, (EBSCO)

3. Conference paper, later published in German language in a scientific journal:
    a. Roscher, Bjarne Erik: Impact of the COVID-19 Crisis on the Structure and Content of Job Advertisements., in Conference proceedings of 3rd International Conference on Research in Business, Management and Economics (ICRBME), Dublin, Republic of Ireland, November 27th-29th, 2020, DOI: 10.33422/3rd.icrbme.2020.11.116
    b. Roscher, Bjarne Erik.: Auswirkungen der COVID-19-Krise auf die Struktur und den Inhalt von IT-Management-Stellenanzeigen. HMD Praxis der Wirtschaftsinformatik. HMD 58, 896–909, 2021, DOI: 10.1365/s40702-021-00734-y (SpringerLink, EBSCO)
4. Roscher, Bjarne Erik: Job Title as an Indicator for Strategic Orientation of the IT Organization?, in Conference proceedings of 11th International Conference on Modern Research in Management, Economics and Accounting (MEACONF), Oxford, United Kingdom, December 18th-20th, 2020, DOI: 10.33422/11th.meaconf.2020.12.81
5. Roscher, Bjarne Erik; IAC-MEM 2021, "CIO Competences and Skills: Comparison of Empirical Findings with Alternative Frameworks", Budapest March 19th 2021, ISBN 978-80-88203-21-6
6. Roscher, Bjarne Erik: Understanding the Theoretical Foundations of CIO impact on organizational effectiveness: Prior and planed research, in Comparative European Research 15th International Scientific Conference for PhD students of EU countries, Online March 29th 2021, ISBN 978-1-9993071-7-2
7. Roscher, Bjarne Erik: Two Decades of CIO Effectiveness Research in the Light of the Principal-Agent Theory: Suggestions for Future Research., in Conference proceedings of 13th International Scientific Conference "New Challenges in Economic and Business Development" 2021 (Conf2021), University of Latvia, Riga, Latvia, May 13th-15th, 2021, ISBN: 978-9934-18-689-9
8. Höpfner, Ronja; Roscher, Bjarne Erik (2021). Enterprise Architecture Management: Requirements for Conception of Key Figures to Ensure Transparency and Efficiency, 4th International Conference on Advanced Research in Business, Management and Economics, Amsterdam, Netherlands Proceedings, July 20th 2021, DOI: 10.33422/4th.icabme.2021.07.20
9. Conference paper, later published in an academic monography

a. Höpfner, Ronja; Roscher, Bjarne Erik (2021). Demonstrate the Impact of Enterprise Architecture Management in the Company by Using Frameworks, the 4th international Business Conference 2021, Conference proceedings – short version, Würzburg International Business Forum, Germany, Proceedings. ISBN: 978-3-949864-00-1
b. Höpfner, Ronja; Roscher, Bjarne Erik (2022). Demonstration of the Impact of Enterprise Architecture Management in a Company by Using Frameworks. In: Emin Akçaoğlu (Hg.): SMEs and international business. Finance, innovation, enterprise architecture and business education. Würzburg, Istanbul: WIBP Würzburg International Business Press; Dogus University, p. 104–119. ISBN: 978-9944-5789-7-4

10. Conference paper, later published in scientific journal:
    a. Roscher, Bjarne Erik; Nissen, Volker: 3rd ICARBME, "The Influence of Demographic Variables on Empirical Studies Concerning CIO Gender", Berlin, March 5th – 7th 2021, DOI: 10.33422/3rd.icarbme.2021.03.141
    b. Roscher, Bjarne Erik; Nissen, Volker (2021). The Influence of Demographic Variables on Empirical Studies Concerning CIO Gennder. In Journal Humanities and Social Sciences: Latvia, Volume 29, Issue 2. DOI: 10.22364/hssl.29.2.04, (EBSCO)
11. Roscher, Bjarne Erik (2023). Chief Information Officer Background, Tenure and Income: Results from a survey in the German speaking countries. 5th International Conference on Modern Research in Management, Economics and Accounting (MEACONF), Berlin, Germany. DOI: 10.33422/15th.meaconf.2023.03.006
12. Roscher, Bjarne Erik (2023). Business IT Alignment - Status quo on a survey amongst top it managers in German speaking countries: A replication study, 4th International Conference on New Trends in Management, Business and Economics (ICNMBE), Athens, Greece. DOI: 10.33422/icnmbe.v1i1.162
13. Roscher, Bjarne Erik; Balina, Signe (2023). Factors Influencing Work-Related Attitudes of Top Managers: An Expert Perspective, Rural sustainability Research, Latvia, Volume 50. DOI: 10.2478/plua-2023-0013, (Scopus, EBSCO)

International scientific conferences:

Conferences in which the results of the research have been reported on:

1. Roscher, Bjarne Erik: "Organizational Setup as a Source for Incumbent Inertia" in 77th Annual Scientific Conference of University of Latvia, "Impact of Globalization to

National Economies and Business", University of Latvia, Riga, Latvia, January 24th, 2019

2. Roscher, Bjarne Erik: "Impact of IT Organizational Ability and the IT Manager Skillset on the Success of IT Departments" in 78th Annual Scientific Conference of the University of Latvia, "Impact of Globalization to National Economies and Business", University of Latvia, Riga, Latvia, January 23rd, 2020
3. Roscher, Bjarne Erik: "Formal Training of IT Managers in Germany: Research Based on Job Advertisements", 2nd International Conference on Research in Business, Management and Finance (ICRBMF), Oxford, UK, March 27th-29th, 2020
4. Roscher, Bjarne Erik; Brink Norbert G.: "Tasks of IT Managers: Empirical Research Based on Job Advertisements in Germany", 3rd International Conference on Applied Research in Management, Economics and Accounting (IARMEA), Paris, France, November 20th-22nd, 2020
5. Roscher, Bjarne Erik: "Impact of the COVID-19 Crisis on the Structure and Content of Job Advertisements", 3rd International Conference on Research in Business, Management and Economics (ICRBME), Dublin, Republic of Ireland, November 27th-29th, 2020
6. Roscher, Bjarne Erik: "Job Title as an Indicator for the Strategic Orientation of the IT Organization?", 11th International Conference on Modern Research in Management, Economics and Accounting (MEACONF), Oxford, United Kingdom, December 18th-20th, 2020
7. Roscher, Bjarne Erik: "Development and Validation of Variables for Quantitative Survey Researching IT Management Effectivity and Efficiency" in 79th Annual Scientific Conference of the University of Latvia, "Impact of Globalization to National Economies and Business", University of Latvia, Riga, Latvia, January 28th, 2021
8. Roscher, Bjarne Erik; Nissen, Volker: "The Influence of Demographic Variables on Empirical Studies Concerning CIO Gender" in 3rd International Conference on Applied Research in Management, Business and Economics, Berlin, March 5th - 7th, 2021
9. Roscher, Bjarne Erik: "CIO Competences and Skills: Comparison of Empirical Findings with Alternative Frameworks", International Academic Conference on Management, Economics and Marketing (IAC-MEM 2021), Budapest, March 19th-20th, 2021
10. Roscher, Bjarne Erik "Understanding the Theoretical Foundations of CIO Impact on Organizational Effectiveness: Prior and Planned Research" in 15th International Scientific Conference for PhD students of EU countries, Online, March 29th, 2021

11. Roscher, Bjarne Erik: “Two Decades of CIO Effectiveness Research in the Light of the Principal-Agent Theory: Suggestions for Future Research”, 13th International Scientific Conference “New Challenges in Economic and Business Development” 2021 (Conf2021), University of Latvia, Riga, Latvia, May 13th-15th, 2021
12. Ronja Höpfner, Bjarne Erik Roscher (2021). “Enterprise Architecture Management: Requirements for Conception of Key Figures to Ensure Transparency and Efficiency”, 4th International Conference on Advanced Research in Business, Management and Economics, Amsterdam, Netherlands, September 23rd-24th, 2021
13. Ronja Höpfner, Bjarne Erik Roscher (2021). “Demonstrate the Impact of Enterprise Architecture Management in the Company by Using Frameworks” in 4th Würzburg International Business Conference, University of Applied Sciences Würzburg-Schweinfurt, Germany, September 24th, 2021
14. Roscher, Bjarne Erik: “Business-IT-Alignment: Results of a Survey Amongst German Speaking IT-Top Managers in the DACH Region” in 80th Annual International Scientific Conference of the University of Latvia, “Impact of Globalization to National Economies and Business”, University of Latvia, Riga, Latvia, January 27th, 2022
15. Roscher, Bjarne Erik: “Effects of Principal Agent Related Problem Reduction Measures on CIO Attitudes.” In 81st Annual International Scientific Conference of the University of Latvia, “Impact of Globalization to National Economies and Business”, University of Latvia, Riga, Latvia, January 26th, 2023
16. Roscher, Bjarne Erik: “CIO Background, Tenure and Income: Results from a Survey in the DACH Region”, 15th International Conference on Modern Research in Management, Economics, and Accounting (MEACONF) in Berlin, March 17th-19th, 2023
17. Roscher, Bjarne Erik: “Business IT Alignment - Status Quo on a Survey Amongst Top It Managers (CIO) in the DACH Region: A Replication Study”, 4th International Conference on New Trends in Management, Business and Economics (ICNMBE), Athens, Greece, April 21st – 23rd, 2023

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1. ESTABLISHING THEORETICAL FOUNDATIONS FOR MANAGERIAL WORK RELATED ATTITUDES

The primary drivers motivating individuals in workplace settings to achieve optimal performance are their work-related attitudes, covering both employees and their managers. Attitudes, as defined by Allport (Allport, 1935, p. 810), denote a predisposition to respond positively or negatively to one's surroundings. The Theory of Reasoned Action, developed by Fishbein and Ajzen in 1975 (Ajzen and Fishbein, 2008, p 289, p 336), posits that attitudes shape intentions, subsequently influencing behavior. Work-related attitudes, notably job satisfaction, have been extensively explored in the literature, with Smith et al. (Smith et al., 1977, pp. 454–460) conducting a longitudinal study on job satisfaction within a corporation over four years, focusing on selected drivers. This dissertation, however, seeks to provide a comprehensive overview of work-related attitudes, specifically work motivation and job satisfaction, while investigating factors influencing these attitudes in the context of top IT managers.

This chapter aims to establish the theoretical framework for the research by reviewing existing literature, initially focusing on the two work-related attitudes: work motivation and job satisfaction. Subsequently, theoretical models influencing work attitudes are examined, followed by an exploration of influential factors. Finally, the chapter identifies research gaps in the current body of knowledge.

1.1. Work related attitudes: work motivation and job satisfaction

Scholars have been arguing that an increase in job satisfaction results in work productivity (Cropanzano and Wright, 2001, p. 182)(Shikdar and Das, 2003, p. 479). Bakotic (Bakotić, 2015, p. 126) points out that although previous research on the relationship between job satisfaction and organizational research has often given inconsistent results, in his research he found that there is a clear link between employees' job satisfaction and organizational performance in both directions. To understand why work motivation and job satisfaction have an effect on performance the theoretical foundations of both work attitudes are described.

Theoretical foundations work motivation

Pindler's definition of work motivation is influenced by the work of various writers beginning with Jones in 1955 followed by Vroom, Steers and Porter, and Locke and colleagues in 1981. He defines it in the following way (Pinder, 2014, p. 11):

> Work motivation is a set of energetic forces that originate both within as well as beyond an individual's being, to initiate work-related behavior, and to determine its form, direction, intensity and duration.

Work motivation theory is the attempt to understand how much effort an employee of a firm will put into their work. The goal of all these theories is to find influencing factors that increase or decrease motivation and to derive suitable approaches to raise motivation at work.

Over time, scholars have proposed several theories with different factors influencing employees' work motivation. Among these is Maslow's hierarchy of needs (Maslow, 1943, pp. 394–395) from 1943, the two-factor theory of Herzberg et al. (Herzberg et al., 2010, p. 81) from 1959, and Deci and Ryans's (Deci and Ryan, 1985, pp. 70–72) concept of intrinsic motivation and self-determination.

Maslow's hierarchy of needs is based on the idea that individuals need preconditions (needs) to feel fulfilled. These needs are sorted in a hierarchical pyramid, whereby the needs at the base of the pyramid need to be satisfied first before others are addressed.

Herzberg, Mausner, and Snyderman's publication "The Motivation to Work," proposes that hygiene factors, such as working conditions, income, competency of the supervisor, interpersonal relationships, and status can be – to a large extent – demotivators if they are inadequate/unavailable. To a much smaller extent, they can lead to motivation if they are present.

On the other hand, the authors propose motivational factors such as achievement, promotion, responsibility, and personal development which have a highly positive effect on work motivation if they occur and only a small demotivating effect if they are not present.

Deci and Ryan propose that the motivation of individuals is dependent on three basic psychological needs, namely autonomy, relatedness, and competence. As a result, they conclude that if these needs are fulfilled, individuals are more likely to be motivated to execute their work.

Grant (Grant, 2008, p. 50) asserted that research evidence indicates that work motivation is a multifaceted concept encompassing the psychological forces that guide, invigorate, and sustain actions and Perry (Perry et al., 2008, p. 445) posited that work motivation could be evaluated as a result of particular management approaches and as a predictor of various job attitudes and behaviors, including job satisfaction and intentions to leave the job.

Fink et al. also stated that companies must recognize that the human factor is becoming much more important for organizational survival, and that business excellence will only be achieved when employees are excited and motivated by their work (Finck et al., 1998 as quoted by Ayub and Rafif, 2011, p. 333).

Pindler described work motivation as the set of internal and external forces that initiate work-related behavior and determine its form, direction, and duration (Pinder, 2014 as quoted by Ayub and Rafif, 2011, p. 333).

Azeem and Quddus quote Van Niekerk (1987) who saw work motivation as the creation of work circumstances that influence workers to perform a certain activity or task of their own free will, to achieve the goals of the organization, and simultaneously satisfy their own needs (Azeem and Quddus, 2014, p. 73).

Wiley (Wiley, 1997, p. 276) analyzed work motivation surveys from over 40 years and identified five main factors driving motivation in jobs which are good wages, full appreciation for work done, job security, promotion and growth in the organization and interesting work.

She also concludes that the involvement in decisions and communication fosters motivation (Wiley, 1997, p. 278). Wiley mentions appreciation of work done (Wiley, 1997, p. 277), the author sees payment of monetary incentives for good or extraordinary work as one form of this promoting factor for work motivation while the base salary satisfies more the basic needs.

Summarizing theoretical foundations of work motivation have been discussed by influential researchers. Pindler's (Pinder, 2014, p. 11) definition of work motivation is described as a set of internal and external forces that initiate and shape work-related behavior. The goal of work motivation theories is to understand the factors that influence employee effort and find ways to enhance motivation at work.

Several key theories, including Maslow's (Maslow, 1943, p. 8840) hierarchy of needs, Herzberg's (Herzberg et al., 2010, p. 81)two-factor theory, and Deci and Ryan's (Deci and Ryan, 1985, pp. 70–72) concept of intrinsic motivation and self-determination deal with the occurrence of work motivation. These theories highlight the importance of different factors, such as needs fulfillment, hygiene and motivational factors, and basic psychological needs, in driving or hindering work motivation.

Work motivation is a complex concept that influences employees' job attitudes and behaviors, like job satisfaction and turnover intentions. It further mentions that companies should recognize the significance of employee motivation for organizational success and lists key factors identified as driving motivation in jobs, such as good wages, appreciation for work, job security, promotion opportunities, and interesting work. Additionally, involvement in decision-making and effective communication are noted as factors that foster motivation.

Theoretical foundations of job satisfaction

Alam (Tanvir Alam, 2012, p. 126) defines job satisfaction as the way employees personally assess their jobs in relation to the factors that are most significant to them. It's important to emphasize that these evaluations are based on emotions and feelings, which means that the level of job satisfaction can significantly affect not only their professional life but also their personal and social life. It can be assumed that this influences an individual's behavior in the workplace. Job satisfaction results according to Sempane et al. (Sempane et al., 2002, p 23-25) from the presents of a particular organizational culture and climate. They discuss that this climate develops due to

1. structural characteristics, including size, structure and leadership style.
2. Individual subjective perceptions of individuals which are influenced by personality and experience.
3. Social interactions at the workplace fostering similar perceptions of the organization.

As financial performance is often regarded as an inadequate measure of an organization's performance, researchers consider that a high level of job satisfaction is an important part of the performance index of a company (Chia, 1995, p. 611).

The term "job" is described as a combination of tasks performed by an individual for financial or other remuneration (Locke, 1969, p. 330) while the term "job satisfaction" was defined by Locke as "… a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (Locke, 1976, p. 1297) quoted in (Chia, 1995, pp. 611–612) and "… viewed [job satisfaction] as an end in itself, since happiness, after all, is the goal of life" (Locke, 1976, p. 1328) quoted in (Chia, 1995, p. 612). Overall job satisfaction comprises all evaluations of the individual elements a job is composed of (Locke, 1969, p. 330).

Teck-Hong and Waheed (Teck Hong and Waheed, 2011, p. 30) define job satisfaction as the satisfaction arising due to the fact that the employee has achieved something. According to Sempane et al. (Sempane et al., 2002, p. 23, p. 25), job satisfaction relates to people's own evaluation of their jobs against those issues that are important to them while Judge and Watanabe (Judge and Watanabe, 1993, p. 947) indicate that overall life satisfaction becomes more influential in a person's life over time.

Schulz and Schulz emphasized that people spend one-third to one-half of their waking hours at work, for a period of 40–45 years, and that this is a very long time to be frustrated, dissatisfied, and unhappy, especially since these feelings spill over into their family and social lives, and affect their physical and emotional health (Schultz and Schultz, 1998) as quoted by (Ayub and Rafif, 2011, p. 335).

Megginson, Mosley & Pietri stated that people experience job satisfaction when they feel good about their jobs and that this feeling often relates to them doing their jobs well, becoming more proficient in their professions, or being recognized for good performance (Megginson et al., 1991) as quoted by (Ayub and Rafif, 2011, p. 335).

As is the case with work motivation, job satisfaction has also been explained using Maslow's (Maslow, 1943, p. 394) "Hierarchy of Needs," Herzbergs (Herzberg, 1979, pp. 69–70)"Motivation of Work," and Deci and Ryan's (Deci and Ryan, 1985, pp. 24–26)"Self Determination Theory."

Pay, promotional opportunities, supervision and coworkers are according to Hulin (Hulin, 1969, p. 281) after the actual work done the most important factors that influence job satisfaction of employees.

This sub-chapter discusses the concept of job satisfaction and its various definitions and influences. Job satisfaction is described as how employees personally assess their jobs in relation to factors that are important to them, primarily based on emotions and feelings. It can significantly impact both their professional and personal lives, including their behavior at work. The factors influencing job satisfaction are attributed to organizational culture and climate, which are shaped by three key elements:

1. Structural characteristics, including factors like the size of the organization, its structure, and leadership style.
2. Individual subjective perceptions influenced by personality and experience.
3. Social interactions at the workplace that foster similar perceptions of the organization.

Researchers consider job satisfaction an essential component of a company's performance index, emphasizing its significance beyond financial performance.

The definition of "job" is explained as a combination of tasks performed for financial or other rewards, while "job satisfaction" is also described as a positive emotion resulting from the appraisal own job experiences. It's viewed as an end in itself since happiness is seen as a life goal.

Various scholars have defined job satisfaction differently. It is also highlighted the significant amount of time people spend at work during their lives and the potential negative impact of job dissatisfaction on their family, social life, and health.

It is additionally mentioned that job satisfaction is related to feeling good about one's job, often linked to job performance, professional growth, and recognition.

Job satisfaction has been explained using various psychological theories by renowned researchers. It also notes that factors like pay, promotional opportunities, supervision, and coworkers are important influencers of employee job satisfaction.

factor is seen as a life goal job satisfaction is an important component to achieve happiness.

Various scholars have defined job satisfaction differently. Some highlight the significant amount of time people spend at work during their lives, while dissatisfaction caused by the job has a negative impact on their family, social life, and health.

Others mention that job satisfaction is related to good feelings about the job, which is often linked to job performance, professional growth, and recognition.

Various psychological theories, created by renowned scholars, have explained Job satisfaction. Factors like pay, promotional opportunities, supervision, and coworkers are impacting job satisfaction of employees.

Motivation to work and job satisfaction differences and similarities

While both work motivation and job satisfaction are related concepts, they focus on different aspects and have distinct factors influencing them. The differences are shown in Table 1-1.

Table 1-1: Differences between factors influencing work motivation and job satisfaction

Aspect	Work Motivation	Job Satisfaction
Definition	Set of forces determining work-related behavior	Personal assessment of job based on significant factors
Theoretical Foundations	Maslow's hierarchy of needs, Herzberg's two-factor theory, Deci and Ryan's self-determination theory	Similar theoretical foundations, including Maslow's hierarchy, Herzberg's theory, and self-determination theory
Factors Influencing	Needs fulfillment, hygiene and motivational factors, basic psychological needs	Organizational culture, structural characteristics, individual perceptions, social interactions
Impact on Behaviors	Influences effort, job attitudes, and behaviors	Influences personal and social life, behavior at work
Measurement Importance	Essential for understanding employee effort	Essential for predicting job attitudes and behaviors
Key Influencing Factors	Autonomy, relatedness, competence	Pay, promotional opportunities, supervision, coworkers

Source: author's summary based on literature review.

Work motivation primarily deals with factors that drive or prevent employee effort, while job satisfaction focuses on the emotional evaluation of the job in relation to personal factors. Additionally, the theoretical foundations for both concepts share some common theories, such as Maslow's hierarchy and Herzberg's theory. However, the key influencing factors and their impact on behaviors are specific to each concept. Yet it is very important to note that Brown and Shepherd (Brown and Sheppard, 1997, p. 214) found that motivation plays a role in enhancing job satisfaction among workers this is also supported by findings of Park (Park, 2010, p. 424).

Influence of job satisfaction and work motivation on performance

While the 'Porter-Lawler Model of the Job Performance-Job Satisfaction Relationship' suggested that job satisfaction and performance are not directly related, they proposed that performance – which can be also described as accomplishments – generates rewards, which in turn generates satisfaction (Riggio, 2016, p. 226, figure 9.3).

According to Park (Park, 2010, p. 409) work motivation, job satisfaction, and turnover intentions of employees represent significant individual-level job attitudes, and their interrelation with organizational performance outcomes can be considerable in specific contexts.

Motivation also positively influences performance at individual and group levels, ultimately affecting organizational performance (Risambessy et al., 2012), whereby a significant effect on motivation and job satisfaction arises from goal achievement (Lather and Jain, 2005, p. 83).

In one study, it was observed that satisfied employees show a higher level of motivation and commitment, which ultimately has a positive impact on the performance and behavior of employees as reflected in their productivity (Tung-Liang Chen and Yi Huang, 2012, p. 2259).

Since employee performance is a joint function of ability and motivation, one of management's primary tasks, therefore, is to motivate employees to perform to the best of their ability (Griffin and Moorhead, 2014, p. 153).

While employee motivation and job satisfaction cannot be isolated, they complement each other and respond to different organizational variables such as productivity and working conditions (Ayub and Rafif, 2011, p. 335).

Hoole and Vermeulen (Hoole and Vermeulen, 2003, p. 52) reported that several studies investigated the relationship between job satisfaction and outward signs of position, status and rank, yet found a need to investigate the relationship between job specific factors and the job satisfaction.

Vinokur et al. (Vinokur-Kaplan et al., 1994, p. 93) reported that certain motivational factors contribute to the prediction of job satisfaction.

Job satisfaction is an emotional response accompanying actions or thoughts relating to work, while motivation is the process that activates behavior. As satisfaction is an attitude, it is possible for a worker to be satisfied with his job but not be motivated. In contrast, motivation leads to satisfaction which ultimately leads to performance (Teck Hong and Waheed, 2011, p. 9).

According to Tietjen and Myers (Tietjen and Myers, 1998, p. 231), sustained improvement in job performance is more closely linked to the core responsibilities outlined in the job description and the intrinsic factors that foster positive attitudes towards those responsibilities, rather than

the presence of a well-equipped office or specific environmental conditions. Furthermore, they suggest that, from a management perspective, a decline in an employee's performance should not be attributed to the absence of incentives or managerial enforcement. Instead, it should prompt a reconsideration of the employee's tasks to ensure that daily fulfillment is derived from their job.

Harter at al. (Harter et al., 2002, p. 276) asserted that their research findings indicated a significant connection between employee satisfaction and engagement, demonstrating their relevance to crucial business outcomes and the applicability of these associations across various corporate settings. Eliyana et al. (Eliyana et al., 2019, p. 147) showed that work satisfaction has a positive effect on work performance.

In their literature review on motivation, Sekhar et al. (Sekhar et al., 2013, pp. 475–482) describe how different motivation dimensions influence individual, and organizational performance. They describe job satisfaction and monetary incentives as two of these dimensions. Figure 1-1 gives an overview of Sekhar et al.'s theoretical construct.

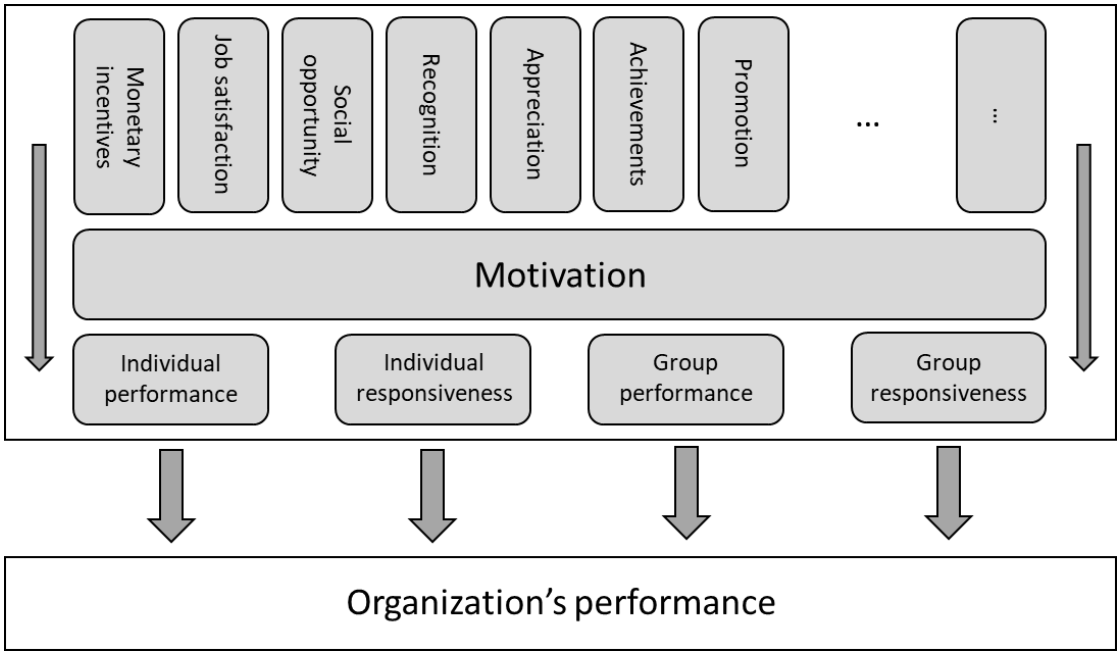


Figure 1-1: Theoretical construct of research dimensions according to Sekhar et al.

Source: adapted from Sekhar et al. (Sekhar et al., 2013, p. 480, Figure 2)

Overall the evidence from research done by several researchers lead to the assumption that both job satisfaction and motivation are drivers for individual and organizational performance.

Rahman (Rahman et al., 2019, p. 9) states that both motivational and job satisfaction factors together accelerates performance efficiency of organizations. Yet, they warn that if any factors remain absent organizations will experience less productivity.

Looking at the relationship between job satisfaction, work motivation, and performance, the Porter and Lawler (Lawler and Porter, 1967, p. 135) suggests that performance leads to rewards, which in turn generate satisfaction. Various studies emphasize the importance of motivation and job satisfaction in influencing individual and organizational performance. Satisfied employees are more motivated and committed impacting their productivity in a positive manner. The role of the management is to motivate employees to perform at their best. Job satisfaction and motivation are interconnected and they respond to different organizational factors like productivity and working conditions. Researchers have discussed the impact of intrinsic factors on job satisfaction and it has been reported that changing job tasks can improve performance. Overall, research suggests that both job satisfaction and motivation are drivers of individual and organizational performance. In contrast, if both satisfaction and motivation are absent it leads to reduced productivity.

This sub-chapter investigates two critical attitudes, work motivation and job satisfaction. Work motivation is defined as a set of internal and external forces influencing work-related behavior. Job satisfaction relates to the emotional evaluation of the individual job experiences of employees.

Work motivation is complex, driven by factors like needs fulfillment and intrinsic motivation. Additionally, it has an effect on behaviors, job satisfaction and turnover intentions. Good wages, job security, promotion opportunities, and involvement in decision-making are drivers for work motivation.

Job satisfaction is influenced by organizational culture, structural characteristics, and individual perceptions of employees. Job satisfaction is more than just financial performance and influenced by the individual life satisfaction. Pay, supervision, and coworkers are factors which play a role in shaping job satisfaction.

Satisfied and motivated employees tend to be more committed and productive. Management plays a crucial role in influencing these factors both on a interpersonal and a organizational level.

In summary, this subchapter highlights the importance of the agents attitudes namely work motivation and job satisfaction for driving individual and organizational performance. It outlines key theories. This discussion sets the stage for understanding how these factors impact the work-related attitudes and as an effect of them, the effectiveness of CIOs and overall organizational performance.

1.2. Theoretical models influencing work attitudes

The topic of IT management and CIO effectiveness has been researched from different angles in the past decades. Even so, the amount of research is limited. Only few publication base on

quantitative research methods investigating the complex relationships and influence factors in this specific management area. Many researchers in the field of business informatics use qualitative research methods. To gain a structured overview of publications which were based on quantitative research (using structural equation models), a structured literature review was done as described in Appendix A. The selected publications have been reviewed by the author for mentions of specific management theories which were then used for empirical research by the scholars. A total number of 11 publications were identified and the results are shown in Table 1-2. The result of the analysis shows clearly that the upper echelon theory is the most used theoretical construct used by researchers.

Table 1-2: Management theories used by different scholars in chief information officer research

	(Enns et al., 2003)	(Smaltz et al., 2006)	(Li et al., 2006)	(Sobol and Klein,	(Cohen and Dennis, 2010)	(Johnson and Lederer, 2010)	(Chen and Wu, 2011)	(Li and Tan, 2013)	(Ding et al., 2014)	(Ricciardi et al., 2018)	(Paré et al., 2020)
Socialization theory	x										
(Modified) Vocational choice	x										
Role based performance theory		x							x		
Role-based stakeholder assessment theory		x									
Upper echelon theory			x	x	x			x	x		
Learning theory			x					x			
Portfolio theory			x					x			
IT strategic alignment						x					
Uncertainty reduction theory						x					
Strobe (stroepis)						x					
Job characteristics theory							x				
Activity competency model							x				
Empowerment theory							x				
Rewards theory								x			
Trait theory of personality								x			
Theory of organizational integration/differentiation										x	
Resource-based view (RBV) and its sister theories										x	
The strategic alignment view						S				x	
Theory of IT function in organizations											x

x: Mentioned theories in publications

S: Source of theory for other scholars

*Source: author's summary based on own publicatio*n *(Roscher, 2021c, p. 45)*

The upper echelon theory mainly focuses on the intrapersonal perceptions, and follows actions of managers. It is an important theory to understand how and why managers act as they act. Yet, managers are also part of a complex social system and need to interact both with their

subordinates but also with their supervisors. For this reason the author has decided to focus on the upper echelon theory and the principal agent theory to cover both perspectives. The consequence of working in an organization for each individual, regardless of the rank, means that work motivation, job satisfaction and ultimately individual and organizational performance will be impacted. Therefore, the subchapter closes by elaborating on these concepts of motivation, satisfaction and performance.

Principal-agent theory – management measures and communication

The literature offers various definitions of the principal-agent relationship, with a broader one provided by Pratt and Zeckhauser (Pratt and Zeckhauser, 1985, p. 2), who assert that an agency relationship emerges whenever an individual relies on the actions of another. In this context, the individual performing the actions is referred to as the agent, and the party affected by these actions is the principal. For example, they describe corporate executives as the principals and their subordinate managers as the agents. A more specific definition comes from Jensen and Meckling (Jensen and Meckling, 1976, p. 307) who define "an agency relationship as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent."

The principal-agent theory builds on the idea of methodological individualism, which tries to explain collective phenomena not based on the identity of the organization itself, yet by analyzing the individual person and their actions (Alparslan, 2006, p. 12). Companies are seen as "… legal frictions which serve as a nexus for a set of contracting relationships among individuals …" (Jensen and Meckling, 1976, p. 310).

The principal-agent theory is based on the fact that a top manager (principal) looks for a specialist (agent) for a specific management job (Eisenhardt, 1988, p. 490), (Eisenhardt, 1989, p. 35). During the selection process, the principal has to deal with the fact that there is an information asymmetry between him and the candidate. To evaluate the suitability of the candidate for the job and, in turn, to prevent adverse selection, he can try to investigate the hidden characteristics of the candidate through different actions such as signaling, self-selection, and screening.

After the candidate is employed, new risks for the principal arise that are also based on the information asymmetry as the new specialist member has a better understanding of his area of responsibility and possibilities for future development and operation. This might result in the fact that the agent does not fully perform his action in line with the strategy and goals of the top management, which might result in opportunistic costs. Measures to compensate for this risk

include monitoring, bonding, and incentives, and all of these are associated with costs, which should be lower than the cost of the opportunistic behavior of the agent. Figure 1-2 shows the interdependencies within the principal-agent model.

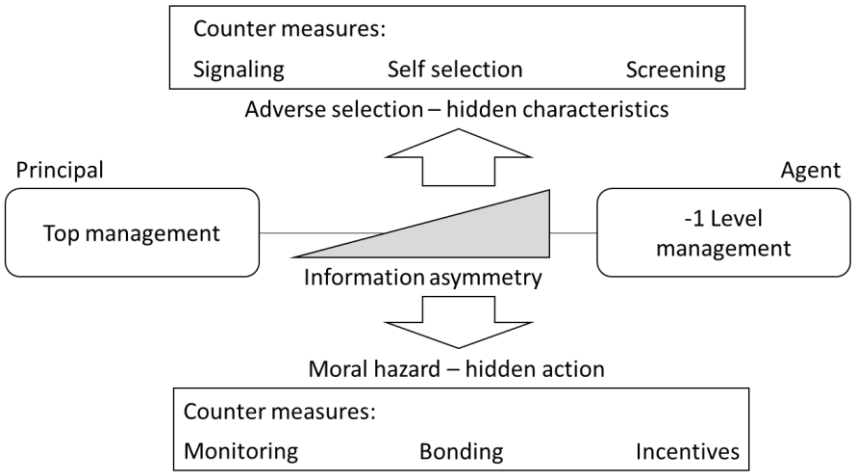


Figure 1-2: Information asymmetry as a driver for agency cost and possible countermeasures

Source: author's illustration, published previously (Roscher, 2021c, p. 46)

Mertens and Knolmayer (Mertens and Knolmayer, 1995, pp. 59–60) state that the IT within a company can be described as the agent within the principal-agent relationship. The principal's role is performed by the executive management namely the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO) and the business process organizations (e.g. product lifecycle management, supply chain management, customer relationship management). In both relationships, information asymmetry, conflicts, and associated costs arise and Figure 1-3 visualizes these interdependencies.

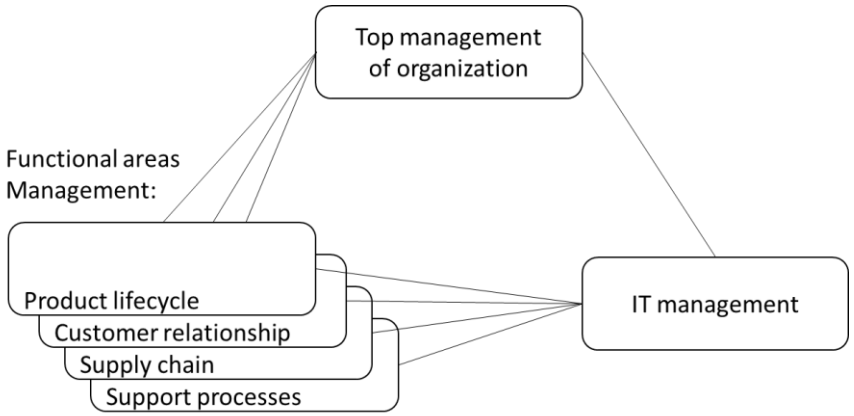


Figure 1-3: Triadic principal-agent relationships in companies

Source: author's illustration adapted from the model of Gurbaxani and Kemerer (Gurbaxani and Kemerer, 1990, p. 282)

Enns et al. explore different barriers and facilitators to obtain peer commitment to strategic IT proposals and describe differences between lower and middle-level manager influence behaviors and those of top executives and CIOs (Enns et al., 2001, pp. 4–5).

This suggests that IT managers could be more successful if they are on the same management level as their peers.

Information asymmetry

Information asymmetry appeared in the scientific literature for the first time in 1970 when Akerlof described the different levels of quality of goods in a market and the information advantage of car sellers over car buyers. In the context of management theory information asymmetry, Connelly et al. (Connelly et al., 2011, p. 42) stated that individual managers make decisions based on both public and private information which is only available to a smaller part of the overall public. Stiglitz (Stiglitz, 2002, p. 469) stated that various people know different things and that workers know more about their own abilities than the firm does.

According to Bergh et al.'s (Bergh et al., 2019, p. 132) literature analysis, a total of five information types could be identified in relevant scientific literature, namely private information, different information, hidden information, lack of perfect information, and information impactedness.

Bergh sorts the five categories into two distinct yet interrelated subgroups:

- creating/sustaining advantages relative to forces for and against transparency
- creating hazards that parties seek to perpetuate or remedy through signals, screens, and ex-ante and ex-post actions.

Information asymmetry arises between those who hold relevant information and those who could potentially make better decisions if they had it (Connelly et al., 2011, p. 42). However, information asymmetry only exists when subordinates' information exceeds that of their superiors (Dunk, 1992, p. 401). The economic impact relates to assigning costs to the processes of obtaining information that help address information imbalances in a wide range of economic and social situations.(Connelly et al., 2011, p. 42). According to Edmondson et al. (Edmondson et al., 2003, p. 297), in the case of executives, the team effectiveness theory implies that "unless group processes is [sic] managed…asymmetric distributions of situation-specific information and interests will reduce top management team decision-making effectiveness."

Furthermore, Bergh et al. (Bergh et al., 2019, p. 131) summarized the topic as follows: "The information asymmetry concept underlies some of the management field's most important theories and topics. Indeed, limited information may be one of the most common problems surrounding human and organizational interactions of any kind."

Using Bacharach's (Bacharach, 1989, pp. 496–515) ideas, Bergh (Bergh et al., 2019, pp. 122–158) stated that information asymmetry can be used by scholars in different ways, namely as an assumption, as a mechanism (Bacharach, 1989, p. 510), and as a construct (Bacharach, 1989, p. 510).

According to Bergh's (Bergh et al., 2019, p. 132) research, information asymmetry is most frequently used as an assumption within a theoretical model. Bergh also gives insights into both the emergence and possibilities for the resolution of information asymmetry.

Conditions leading to informational asymmetry (Bergh et al., 2019, pp. 133–135) include unobservable or uncertain qualities, structural barriers, and strategic and behavioral barriers to sharing information.

On the other hand, the resolutions to asymmetry (Bergh et al., 2019, pp. 135–140) utilize incentives to gather and disclose information, precommitment, monitoring and rewards, conveying information via actions, information intermediaries, information concealment, impression management, decoupling, and linking resolutions and antecedents. According to the authors own past experience, he believes that if one party within the principal agent relationship discloses privileged information, the other party will also do so with the effect of building two sided trust.

In this work, the following constructs of information asymmetry resolutions will be used as a measurement construct for cause variables: incentives to gather and disclose information, precommitment, monitoring and rewards, and conveying information via actions.

Generally, both principals and agents can increase and reduce information asymmetry, which leads to a 2x2 matrix of four different combinations. However, only two of these apply in employee-employer relationships as demonstrated in Figure 1-4.

		AGENT **Party with the informational advantage**	
		Increasing Information Asymmetry	Reducing Information Asymmetry
PRINCIPAL **Party with the informational disadvantage**	Increasing Information Asymmetry	"Collusion" Toward a Third Party Example Agent: (Bidding) Firm Example Principal: Investment bankers	Pay Secrecy Example Agent: Employee Example Principal: Employer
	Reducing Information Asymmetry	Natural Home for Agency Theory Example Agent: Manager (Firm) Example Principal: Shareholders	Gainsharing and Mutual Monitoring Example Agent: Employee Example Principal: Employee

Figure 1-4: Information asymmetry scenarios between agents and principals

Source: unchanged from Bergh et al. (Bergh et al., 2019, p. 142)

In a healthy principal-agent relationship between a superior and subordinate manager, both sides should collaborate to reduce their respective levels of information asymmetry about each other (Bergh et al., 2019, p. 140) to achieve organizational performance.

In summary this paragraph discusses the concept of information asymmetry, which originated in 1970 when Akerlof (Akerlof, 1970, pp. 490–491) introduced it in the context of the quality of goods in markets, specifically car sellers having an information advantage over buyers. In

management theory, information asymmetry pertains to how individual managers make decisions based on public and private information, and this imbalance can create advantages or hazards. Information asymmetry occurs when subordinates have more information than their superiors. The economic implication involves the cost of resolving information imbalances. It affects decision-making effectiveness in top management teams and is a common issue in human and organizational interactions. Scholars use information asymmetry as an assumption, mechanism, and construct in their research. Conditions leading to asymmetry include uncertain qualities, structural barriers, and strategic and behavioral obstacles to sharing information. Resolutions to asymmetry involve various strategies like incentives, precommitment, monitoring, and conveying information via actions. In a healthy principal-agent relationship, both parties should collaborate to reduce information asymmetry for improved organizational performance.

Trust

A general trust model was discussed by George Simmel (Simmel, 2016, p. 393). In volume 11 of his work on sociology, the philosopher intensively researched the item of trust. He differentiates trusting individuals from non-trusting individuals based on the amount of knowledge they have, whereby persons with all necessary knowledge do not need trust, while individuals with no knowledge cannot reasonably have trust.

Akerlof connects the concept of trust with information asymmetry. He describes trust as informal unwritten guarantees which are preconditions for trade and production (Akerlof, 1970, p. 500).

Furthermore, Ensminger (Ensminger, 2001, p. 199) specifies that "This suspension of account-keeping is in fact the essence of trust. Trust has replaced the need to monitor daily performance, thus gradually relieving both parties of a great accounting burden. In its final stages, this form of trust appears to be the antithesis of strategic calculation."

Werbel and Lopes Henriques (Werbel and Lopes Henriques, 2009, pp. 780–781) extend the concept of trust to the relationship between supervisors and subordinates while Brower et al. (Brower et al., 2009, p. 338) mention that they found strong support for "the power of being trusted (manager's trust in the subordinate) on subordinate behavior and intentions."

The main reason for the emergence of trust in agents is through norms and ethical standards. Casadesus-Masanell (Casadesus-Masanell, 2004, p. 39) also posits that "[contrary to the] standard agency model, agency with trust results in total surplus being shared between the principal and agent. Moreover, the first best outcome may ensue in highly uncertain environments [especially if agents are risk averse]."

This is in line with Podsakoffs et al.'s (Podsakoff et al., 1990, p. 108) findings, that followers' trust in their leaders is mediated by citizenship behaviors[1].

Based on the results from scholars, Vanneste et al. state that trust and relationship duration is positively correlated, but weak. Furthermore, they write that there are two mechanisms for how trust develops over time (Vanneste et al., 2014, p. 1898):

> First, trust between parties may increase as they learn about each other's trustworthiness …; however, learning leads to more trust only in the case of pessimistic initial beliefs about such trustworthiness.
>
> Second, exogenous changes in relationship value also affect trust as a situation-specific construct. Situations can differ in the potential gains (or losses) arising from a relation with a trustworthy (or untrustworthy) partner.

Mayer and Gavin (Mayer and Gavin, 2005, p. 883) showed that trust in management allows employees to focus on the tasks needed to add value to their organization.

CIOs should work on getting a trusted advisor on IT topics by utilizing competence and credibility and by showing chief executive offiers their understanding of business processes and business trends (Benlian and Haffke, 2016, p. 116).

Arnitz et al. (Arnitz et al., 2017, p. 82) researched trust between CIOs and chief executive officers and found that trust affects information behavior and especially information sharing. On the other hand, they found that withholding information negatively affects trust perceptions.

Schoormann et al. (Schoorman et al., 2007, p. 352) investigated the relationship between the principal and agent and stated that "Issues of power and information asymmetry make this relationship and the trust it produces somewhat unique."

Permeaux and Bedeian (Premeaux and Bedeian, 2003, p. 1541) state that "An increased understanding of both top-management openness and trust in [the] supervisor has potential practical applications for enhancing lives and organizational effectiveness."

Mutual understanding creates trust in a principal-agent relationship and might therefore be beneficial regarding organizational effectiveness.

From own paractical observations and talks with employees of companies in real business life, the author believes that missing trust or even distrust can lead to increased turnover intention, and decreased work motivation and job satisfaction. This believe of the author is supported by findings of Zeffane and Melhem (Zeffane and Melhem, 2018, pp. 400–401).

In summary trust in the context principal-agent relationships has been used by various scholars. George Simmel's trust model links trust to individuals' knowledge levels. Trust is described as

[1] Citizenship behaviors were first defined by Organ as behaviors that are not part of emolyees' formal role requirements but that promote the effective functioning of organizations. (Organ (1988).

informal guarantees essential for trade by Akerlof (Akerlof, 1970, p. 500), and Ensminger (Ensminger, 2001, p. 199) highlights its role in reducing the need for daily performance monitoring. Trust extends to supervisor-subordinate relationships and impacts subordinate behavior.

Norms and ethical standards often lead to trust, which can result in a shared surplus between principals and agents. Trust in management allows employees to focus on value-added tasks.

For CIOs, building trust is crucial. Trust influences information sharing between CIOs and the executive supervisor. Trust in principal-agent relationships is unique due to power dynamics and information asymmetry. Understanding and trust in top management and supervisors can enhance organizational effectiveness, emphasizing the importance of mutual understanding in building trust within these relationships.

Moral hazard and hidden action

The concept of "moral hazard" is widely used in the area of economics literature and in the law and policy debate. Baker summarizes by stating that "moral hazard refers to the tendency for insurance against loss to reduce incentives to prevent or minimize the cost of loss" (Baker, 1996, p. 239). Originally coming from the insurance economy, the concept of moral hazard was later generalized and applied to the principal-agent situation (Baker, 1996, p. 260, subnote 100). Holström (Holmström, 1979, p. 74) states that "… a problem of moral hazard may arise when individuals engage in risk sharing under conditions such that their privately taken actions affect the probability distribution of the outcome." Mas-Colell et al. (Mas-Colell et al., 2011, p. 477) define hidden action problems which are also widely known as moral hazards as the manager's inability to see how hard his employees are working. Dunk (Dunk, 1992, p. 401) suggests that agent participation in the budget process might give superiors access to private information in an attempt to gain mutual understanding. However, information asymmetry may enable subordinates to accomplish weekly goals in participative set budgets with the intention to enhance their compensation possibilities. This example describes the unfavorable usage of private information against the principal.

There are different ways to counteract such behaviors, including monitoring, bonding, and incentives.

Bonding can be seen as a form of insurance for the employer that protects the organization from the harmful behavior of the employee. Bonding can involve upfront payments to the organization in cases where managers need to invest in the organization they work for, either in a buy-out scenario or in a franchise system. However, bonding is very seldom seen in normal employment setups between a company and its managers and workers and will therefore not be discussed further. The author is of the opinion that bonding in term of a upfront work contract

which fixates regulations to minimize hidden actions are not very effective as these might fit at the beginning of an employment but over time circumstances change over time – especially in a VUCA influenced world. An such clauses in the work contract might rather display aspects of general distrust by the employing organization rather than an inviting collaborative and trustful environment. Yet the author thinks that in special cases bonding might make sense like in franchise systems.

Incentives are means to motivate or encourage someone to do something which would not have been done otherwise. In other words, incentives promote action in individuals.

The story of Mao and Deng shows how incentives can change the behavior of individuals:

> One day Deng Xiaoping decided to take his grandson to visit Mao. 'Call me granduncle,' Mao offered warmly. 'Oh, I certainly couldn't do that, Chairman Mao,' the awe-struck child replied. 'Why don't you give him an apple?' suggested Deng. No sooner had Mao done so than the boy happily chirped, 'Oh thank you, Granduncle.' 'You see,' said Deng, 'what incentives can achieve' (as quoted by Eisenhardt from "Capitalism" 1984, p. 62) (Eisenhardt, 1989, p. 57).

In the field of companies, Baker et al. (Baker et al., 1988, p. 593) state that researchers and practitioners need to have a good understanding of incentive structures to understand how individuals behave within their organizations.

Miller and Whitford (Miller and Whitford, 2002, pp. 237–238) state that "As long as agents are risk-averse, principals may succeed in inducing effort even in the presence of an information asymmetry, but only at a personal and social cost. This efficiency loss may be sufficient to justify an abandonment of incentives in favor of paying for direct monitoring and supervision. For example, we notice that, in practice, incentive plans that are laden with risk often run into serious problems in practice."

Incentive plans sometimes also carry negative potential depending on their design. For instance, Wilcox (Miller and Whitford, 2002, p. 258; Wilcox, 2000, p. 238) reports that employees of Dot-Com companies discovered that stock options were a risky form of compensation and the employers shifted toward salaries to attract new workers.

This is why in the setup of his questionnaire, Park (Park, 2010, p. 435) used formulations that enable the participant to distinguish if the incentive system is designed fairly and operates well.

In general the author thinks that incentives need to be adapted carefully to the type and nature of an organization. A very small enterprise for example in the area of craftsmanship or building machinery where the owner / leader knows exactly what an employee's job is, and quality is clearly measurable incentives do not bring any value add. This is why this research will focus

on companies with >125 Mio€ which normally have a complexity that doesn't allow the executive to supervise the agents directly.

In summary the anecdote involving Mao and Deng (Eisenhardt, 1989) illustrates how incentives can influence people's behavior. Deng's suggestion to Mao's grandson to give him an apple in exchange for being called "Granduncle" highlights the power of incentives in shaping individuals' actions. This concept extends to the field of companies, where researchers emphasize the importance of understanding incentive structures to comprehend how individuals behave within organizations. However, incentive plans can have both positive and negative impacts. They suggest that while incentives can motivate individuals, they may lead to efficiency losses and risk when not designed effectively.

Principals install monitoring measures when they either want to implement performance-based payments and incentives or if they mistrust that the agent is disclosing all private or hidden information necessary for evaluating his outcomes. As with Incentives the author is the opinion that in small enterprises monitoring is easier and a routine day to day work and therefore no performance monitoring system is needed. For bigger and therefore more complex organizations the need for monitoring will be more value adding.

The question of whether monitoring or incentives are more suitable as countermeasures were investigated by Demougin and Fluet (Demougin and Fluet, 1997, p. 2). They found that principals use less monitoring if agents' liability limit is relaxed or if monitoring costs increase. Instead, principals would use incentives.

Few scholars have researched these countermeasures with respect to the CIO role. Among them are Richardson et al. (Richardson et al., 2018, p. 53) who investigated the question of how equity incentives could be used to align the CIO role with the overall firm objectives. One of their findings was that firms that have higher CIO equity incentives show greater accounting and market performance.

One risk with the concept of monitoring is based on the idea of "what you ensure is what you get." This is why the conception and implementation of IT key performance indicators and IT key figure systems need to be based on performance measures as it helps maximize corporate success (Höpfner and Roscher, 2021, p. 46).

One influencing factor is how CIOs act – i.e. if they are more of a strategic or utilitarian CIO. Examples of the different CIO measurement constructs are shown in Table 1-3.

Table 1-3: Different IT-key performance indicators definitions based on different types of chief information officers

	Strategic CIO	Utilitarian CIO
Definition of IT key performance indicator	• No. of controls triggered • No. of threats successfully treated • Budget deviation • Cost caused by non-treated threats • Net benefits	• Uptime • Budget execution • Support desk response time • Governance

Source: based on Sobols and Kleins (Sobol and Klein, 2009, p. 272) and on Paz et al. (La Paz et al., 2018, Figure 3)

In summary monitoring is used when principals want to implement performance-based payments or when they mistrust that agents are disclosing all necessary information. Less monitoring is used when agents' liability limits are relaxed or monitoring costs increased, opting for incentives instead. Equity incentives in the CIO role are found to have a positive impact on firm performance. Literature also highlights the importance of performance measures by using IT key performance indicators and mentions that CIOs' behavior (strategic or utilitarian) can influence measurement constructs.

Upper echelon theory – collective alignment

In 1984, Hambrick and Masen developed the upper echelon theory which was based on the idea that senior executives experience situations based on their individual backgrounds, and these experiences influence how they view and evaluate different situations. The individual backgrounds of managers arise due to different experiences, values, and personalities as well as other human factors (Hambrick, 2018, p. 1782), which include cognitive abilities, personality traits, and demographic characteristics.

When considering not only the individual chief level officers but also the overall top management team, the upper-echelon theory suggests that organizational performance is impacted by interactions between the different top management team members (Hambrick, 2007, p. 336). However, in his 2007 revision of the upper echelon theory, Hambrick also wrote that “the theory offers a good prediction of organizational outcomes in direct proportion to how much managerial discretion exists” (Hambrick, 2007, p. 335).

Charas highlighted that corporate success hinges on directors' behaviors, including effective information exchange, the cultivation of trust and a shared perspective, and a collective belief in their capacity to achieve their objectives (Charas, 2015, p. 126).

Agnihotri and Bhattacharya (Agnihotri and Bhattacharya, 2022, p. 1727) describe that the greater the functional and educational heterogeneity of a top management team is, the higher the job satisfaction of its members.

Hence, on the one hand, CIOs are individual members of an organization who view and experience the organizational processes based on their background and experiences. However, on the other hand, all other CXOs also function in the same way, as to guarantee or even improve organizational performance, they need to join forces and align for the sake of the company's performance and future. Joining forces brings all the individual backgrounds and experiences forward which will then form the basis for common decisions and future strategies. From the perspective of a CIO, this can be done by developing mutual understanding and working towards a business-IT alignment process, both of which are founded on a trustful relationship among the top management team members and a certain level of IT knowledge on the part of the other top managers.

This theoretical chapter provides an overview of various management theories influencing organizational performance, particularly in the field of IT management and the effectiveness of Chief Information Officers (CIOs). It begins by addressing the scarcity of research on IT management and CIO effectiveness, focusing on the "upper echelon theory" as a prevalent construct. This theory highlights how the experiences, values, cognitive abilities, personality traits, and demographic characteristics of senior executives, including CIOs, influence decision-making and strategies. The sub-chapter then explores the correlation between work attitudes (such as motivation and job satisfaction) and their impact on CIO effectiveness, arguing that heightened job satisfaction leads to increased productivity.

This chapter explores the theoretical foundations of work motivation and job satisfaction, drawing from Maslow's Hierarchy of Needs, Herzberg's Two-Factor Theory, and Deci and Ryan's Self-Determination Theory. Then the concept of the principal-agent theory and its elements of information asymmetry, moral hazard, and hidden actions are explained. Additionally the constructs of mutual understanding and trust, provide insights into the relationships between top IT management and executive management. The chapter emphasizes the role of interactions within top management teams in influencing organizational outcomes, highlighting the collective experiences and values of the team as integral factors. In summary, this chapter offers a comprehensive overview of relevant management theories and concepts, shedding light on the multifaceted role of CIOs and IT management in organizational performance, emphasizing factors like work motivation, job satisfaction, trust, and the dynamics within top management teams that shape the effectiveness of CIOs and contribute to the overall success of organizations.

1.3. Influential factors in IT management and their impact on work-related attitudes

Throughout the history of business external influences have always been a driver for change in companies. As companies are more and more dependent of information technology this comes along with the need to adopt business practices and processes and in due course adopt IT architecture. Due to the 4th industrial revolution which focuses on the development and use of cyber-physical systems, organizations have to cope with volatility, uncertainty, and business complexity, and, for this reason, markets are in a state of unrest and changing competition (Doheny et al., p. 7). To address the effects of VUCA and to increase organizational performance, Bennett and Lemoine (Bennett and Lemoine, 2014, p. 313) suggest reacting with agility toward volatility, with information in response to uncertainty, with restructuring in the face of complexity, and with experimentation to overcome ambiguity. Within companies, VUCA also has effects on the organization, the processes, and locations and this is especially true from an information technology point of view (Minciu et al., 2020, p. 237). But also the the 5th industrial revolution, which focusses on the human centered production and resource efficiency (Vogel-Heuser and Bengler, 2023, p. 1126) will bring new challenges for IT organizations which go beyond the technical aspects of information management. New technology which suddenly available for the the public like artificial intelligence based on large language models impacts how both the business and the IT employees work with direct implications on personal development of employees (Shet, 2024). Figure 1-5 visualizes the effects of actions performed due to external VUCA influences on the IT management and IT ecosystem and its results on the company's success. As a response to these challenges, and thus as a competitive advantage, companies progressively value the increase in development speed and the continuous development of systems with even larger amounts of data (Benardis et al., 2017), (Tannady et al., 2020, p. 1466).

However, in addition to the expected benefits, this approach can also have negative effects on the company as rapid and continuous development can encourage the proliferation of non-integrated systems. The consequences are redundancies, inconsistencies, and a different understanding of the maintained data as well as increased complexity and insufficient support of processes in a holistic view.

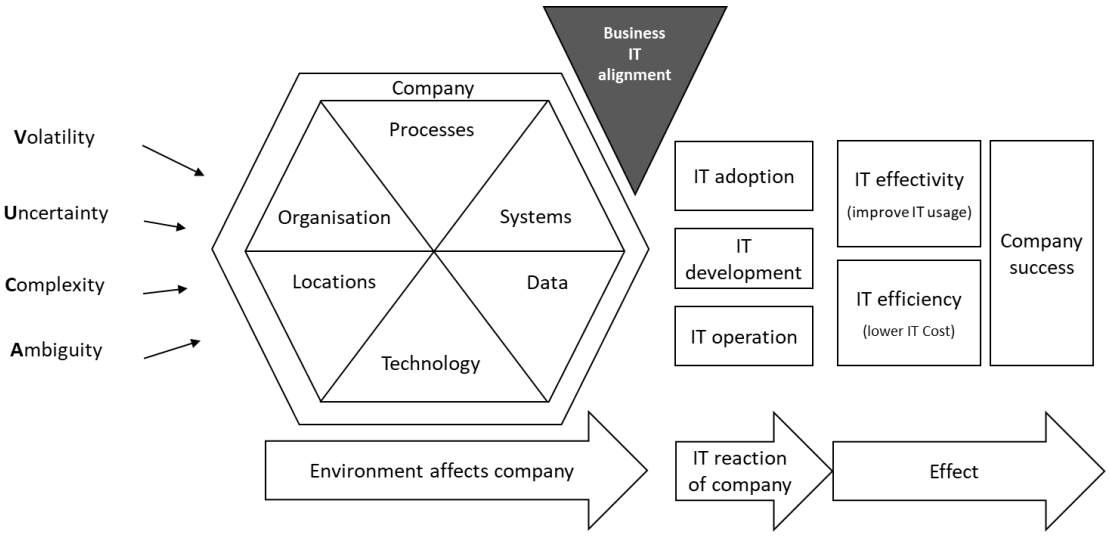


Figure 1-5: IT Organizations react to external influences

Source: author's depiction based on Höpfner and Roscher (Höpfner and Bjarne Erik Roscher, 2022, p. 105) and Kempis and Ringbeck. (Kempis and Ringbeck, 1998, p. 17)

The effects of the consequences mentioned are expensive "repair processes." In addition, incorrect databases lead to wrong decisions in the operative business, which can even result in an incorrect alignment of the business model. This has incalculable consequences that can ultimately threaten the very existence of the entire company (Höpfner and Bjarne Erik Roscher, 2022, p. 105). To control these effects, organizations often choose to delegate the responsibility of taking care of the IT to dedicated IT managers or CIO. These act on behalf of the managing board and their officers.

In most cases, CIOs report directly to chief executive officers or chief financial officers (Banker et al., 2011, p. 488) in a principal-agent type of relationship (Gurbaxani and Kemerer, 1990, p. 282).

Business IT alignment and IT strategy development

Scientific Literature in the area of business informatics has focused on the actives dealing with this change by proposing business it alignment activities and processes which are the foundation for a successful IT strategy development. It is important to mention that IT strategy always needs to be developed on the basis of a business strategy and the underlying business model (Hofmann and Schmidt, 2010, p. 11), (Johanning, 2014, p. 7). On the one hand, IT strategy supports business processes and business models, while on the other hand, the provision of the Enterprise Architecture supports it on a day-to-day basis. Figure 1-6 shows the required building blocks and the involved stakeholders in organizations for the continuous development of the IT architecture and application landscape (Durst, 2007, p. 5). From an IT management point of view, Enterprise Architecture Management, which sometimes also is referred to as IT architecture, is the operative component of the available design dimensions. According to

Johanning (Johanning, 2014, p. 27), the three core components of IT strategy development are situational analysis, strategy formulation, and strategy implementation. It is important to understand that IT strategy is a subset of the overall corporate strategy.

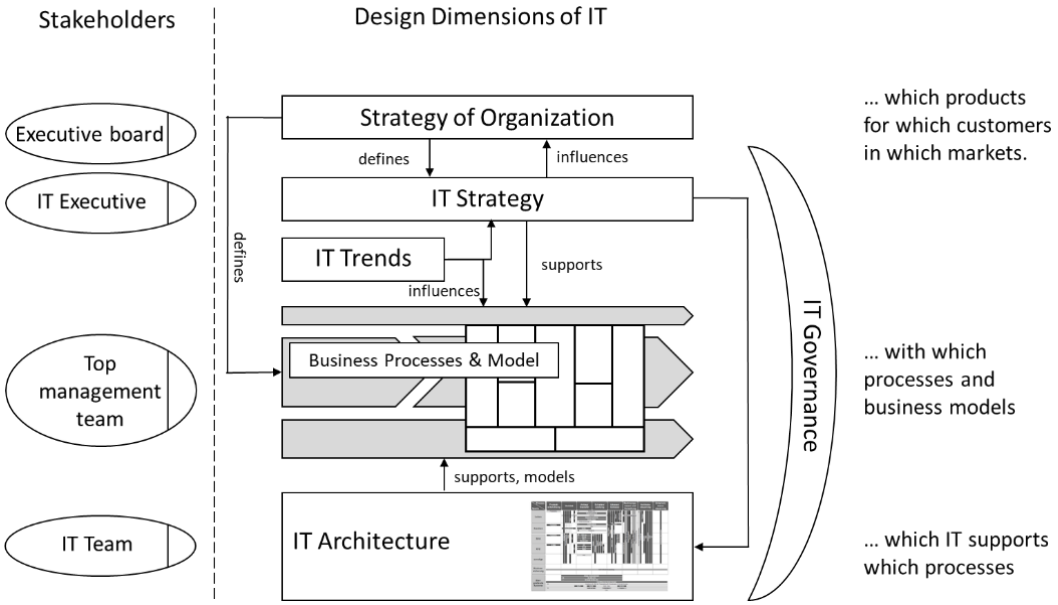


Figure 1-6: IT in the context of the organization

Source: author's depiction based on Durst's IT design dimensions (Durst, 2007, p. 5)

Every IT strategy aligns with one of three strategic options: 1. creating innovative IT for value-adding processes, 2. automating standardized processes, and 3. optimizing commodities. The goals for the company include increasing efficiency, reducing costs, and generating added value through IT.

The specific objectives of the IT strategy are more detailed and concrete (Johanning, 2014, p. 37). These include enhancing business-IT alignment to improve collaboration and enable more effective requirements management. Additionally, there is a focus on accelerating time-to-market, which means efficiently delivering new IT services. Restructuring the IT organization to adapt to new technologies, business processes, and models, along with the associated requirements for skills and capabilities of IT staff, is also essential. Furthermore, there is an aim to position IT more effectively within the company's management team and to expand IT responsibility towards either a demand-oriented or process-oriented organization.

The author is of the opinion that for IT organizations which exceed a certain number of internal customers the need of a business IT alignment procedure is necessary. Starting in small organizations by implementing simple demand processes utilizing the ITIL framework (ITIL® service design, 2011), ending in big organizations with a tailored and sophisticated organization that design, implement, operate and improve organization wide strategy and alignment processes.

In summary it can be stated that IT strategy development, based on business strategy and models, aligns with three core options: innovation, automation, and optimization. The objectives include enhancing business-IT alignment, accelerating time-to-market, and restructuring the IT organization to adapt to new technologies and processes. Overall, IT strategy should create efficiency, reduce costs, and generate added value within the context of the corporate strategy.

Roles of IT executives in organizations

The most senior manager working with IT in the organization with the mission to support the goals of the enterprise is commonly called the chief information officers but may, at least in the German-speaking world, also have other job titles depending on the size of the company, the organizational integration, the strategic orientation (Roscher, 2020b, pp. 50–51), the company culture, or the strategic orientation of the IT function. In many cases, the CIO reports directly to the chief executive officer or the chief financial officer and, in some cases, to the chief operating officer or chief technology officer.

In some companies, the CIO is a member of the managing board of directors and, in most companies, also serves on the top management team together with other functional heads of business processes such as the chief operating officer, chief marketing officer, chief technology officer, and others (Banker et al., 2011, p. 489), (Johanning, 2014, p. 16).

In 1981, Synnott and Gruber defined the role of the CIO as the "senior executive responsible for establishing corporate information policy, standards, and management control over all corporate information resources" (Synnott and Gruber, 1981, p. 66).

Besides this early definition the terminology and typology of IT management can be found in the European Skills/Competences, Qualifications and Occupations Framework (ESCO). ESCO is an internet portal (European Commission) which allocates the top IT management position of the CIO to the Code 1330.2 and lists different alternative job titles[2].

"Chief information officers define and implement the ICT[3] strategy and governance. They determine the necessary resources for the ICT strategy implementation and anticipate ICT market evolutions and company business needs. They contribute to the development of the organization's strategic plan and ensure that the ICT infrastructure supports the organization's overall operations and priorities" (European Commission).

The history of IT management and digitization began with the emergence of IT systems in the 1950s and there usage to start automation of tasks in organizations.

[2] German language: EDV-Leiter, IT-Manager, CIO, IT Leiter, and English language: Head of IT and IT director
[3] ICT stands for Information and Communication Technology

The CIO role emerged in the 1970s as a result of the increased importance placed on IT (Gottschalk and Taylor, 2000, p. 2).

Previously, the role was mostly technically oriented, whereas today there is a demand for managers who have a precise understanding of the business. IT executives are able to assess where IT provides an added value for the organization. In some cases, CIOs even take on methodical process responsibility (Johanning, 2014, p. 14).

With the change from a technical to a strategic manager, the job title also changed from information manager to chief information officer .This new title is more precise as it implies that the position is part of the top-management and not on the administrative level (Heinrich et al., 2014, p. 74).

Chun and Mooney (Chun and Mooney, 2009, pp. 330–331) reflect on Ross and Feeny's (Ross and Feeny, 1999, p. 15) "Evolution of the CIO role" and propose a bifurcation of the CIO role where CIOs are expected to either take the role as the innovator who drives cross functional integration, inter-organizational integration, process innovation and who enables business strategy. While the other path is to manage IT supply, drive cost containment and typically reports to the CFO.

In Germany, IT-responsible persons originally held the job title of EDV-Leiter (Head of electronic data processing) and their main tasks were IT operations and the provision of IT systems and IT applications. With the growing importance of IT within organizations, the requirements and responsibilities relating to the role have also grown. While the CIO is still tasked with providing reliable, effective, and efficient provision of IT-infrastructure, they also influence the usage of IT regarding the value added and business model development and support (Hofmann and Schmidt, 2010, p. 103).

In 2014, Johanning visualized CIO priorities based on a survey conducted by the Gartner Executive Program in 2013, according to business and technological priorities (Johanning, 2014, p. 15),

According to the Info-Tech Research Group (Info-Tech Research Group, 2022), Edwards (Edwards, 2022), and Dadhich (Dadhich, 2022), the top priorities of CIOs for 2022 are shown in Table 1-4.

Table 1-4: Chief information officer priorities in 2022

Edwards	Info-Tech Research Group	Dadhich
Strengthening cybersecurity skills	Reduce friction in the hybrid operating model	Cybersecurity and cyber-physical systems
Improving digital dexterity	Improving ransomware readiness	Using artificial intelligence and machine learning cybersecurity tools
Advancing automation	Support an employee-centric retention strategy	Advanced cloud computing implementation
Committing to sustainability	Design an automation platform	Modern data analytics
Upgrading talent recruitment and retention	Prepare to report on new compliance metrics	Upgraded collaboration technologies
Committing to the cloud		Productivity improvements
Reinforcing privacy		Skilling or finding tech talent
Coping with the covid-19 pandemic situation and its aftermath		Advanced technologies and automation
		Sustainable architecture
		Intense focus on customer experience

Source: author's summary based on web resources provided by Edwards (Edwards, 2022), Info-Tech Research Group (Info-Tech Research Group, 2022), and Dadhich (Dadhich, 2022).

Gartner (Gartner Inc., 2022) mentions three top CIO priorities for 2022: enabling multiple and competing business priorities, addressing the scarcity of talent and digital dexterity, and redesigning work for a hybrid model. Today, IT supports business processes and is used to solve well and semi-structured decision problems, thereby making business processes more efficient and more effective (Urbach and Ahlemann, 2016, p. 35). As IT becomes more affordable and accessible for non-IT staff, and as there is an increasing need for business model supporting tasks and IT strategic alignment within the business processes, there arises a problem of overlapping responsibilities for IT-related tasks among different positions. Therefore, it is necessary to clearly define the role of the CIO and distinguish it from the roles of neighboring professions.

Companies generally use various types of technology for their operations or their product and service offerings and all these technologies have a different focus regarding their internal or external use. In 2018, McKinsey & Company suggested that CIOs are solely focused internally and manage the technology and product aspects while CTOs have a more external focus involving products and technology (Borden et al., 2018, p. 4).

In contrast, chief digital officers have an equal internal and external focus, as they manage technology, products, and the business aspects of the application of these (Borden et al., 2018, p. 4). Walchshofer and Riedel (Walchshofer and Riedl, 2017, p. 334) describe the role of a chief digital officer as being – in terms of strategic alignment – superior to that of the CIO. The chief digital officer is cross-functional and the digitization and digital transformation of the company

are the focus of this role. Figure 1-7 visualizes the responsibility of the different technology top managers on the executive level.

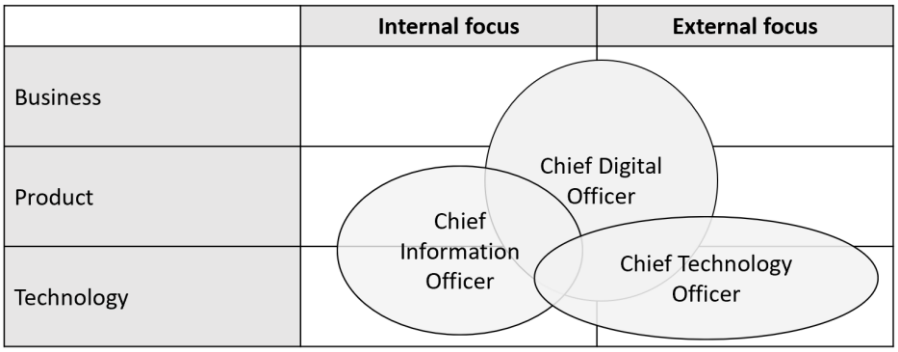


Figure 1-7: The chief information officer's position is distinct from that of other technology executive level managers.

Source: adapted from McKinsey (Borden et al., 2018, p. 4)

However, the content of work and area of responsibility underlies great differences from region to region, branch to branch, and company to company and are especially influenced by the experience and skills of the person who holds the top executive technology title. This results in the fact that a CIO could take on the tasks of a chief digital officer and chief technology officer. According to the authors own knowledge, a chief technology officer could be responsible for the IT and be head of the CIO/IT manager at the same time, as is the case for Fujitsu Computers in Germany.

Challenges faced by chief information officers

The challenges that CIOs face are both diverse and dynamic as the CIO function operates "in the eye of the hurricane" – internal and external influences dictate the daily tasks and strategic orientation and the VUCA effect is highly visible.

However, more generalized IT challenges are very similar across industries and organizations, and business consultant organizations and IT media annually publish articles about the current or upcoming CIO challenges of the year. For the year 2022 based on an internet content analysis of eight renowned IT business research reports (Hetzel; 5 Challenges CIOs and IT Leaders Are Facing in 2022, 2022; Howells, 2022; Martinez Aguilar, 2022; Moore, 2022; Samuels, 2021; Shepard, 2022; Trefler, 2022) following challenges were identified and ranked according to the frequency of mentioning (number of mentioning's in bracket): 1. talent (7), 2. hybrid and security (all 5), 3. business, customer, sustainability, technology (all 3), 4. automation, cloud, data, governance, transformation (all 2). The results suggest that Chief Information Officers not only have to tackle technological challenges but also labor market distortions coming from various events in the last years like COVID-19, global supply chain problems resulting from single events or from regional crises.

Apart from these short-term, topic-based challenges, CIOs also have to cope with structural issues such as the integration into the overall company structure, the role of IT in the organization, and the tasks, skills, and competencies of the IT top managers, followed by the daily struggle to achieve business-IT alignment. Only if all these aspects seamlessly work together can a CIO and his/her organization be successful and support the performance of the overall company.

One factor which influences the success and the performance is the organizational integration of IT within the firm. How IT is set up in a company mainly depends on two factors. One is the history of the company and the other is based on how the company competes in the marketplace. For instance, if one considers Porter's differentiation strategy (Porter, 1985, p. 14), IT should be organized decentral as this creates the degree of flexibility that a company needs to support differentiation (Krcmar, 2015, p. 456). Such decentral setups of organizations creates a larger level of information asymmetry was associated with a higher level of job satisfaction for managers working under conditions of high decentralization (Chia, 1995, p. 609). Higher job satisfaction in turn is connected with higher productivity.

However, when the strategy is geared toward cost leadership (Porter, 1985, p. 12), standardization and automation are essential and this can best be achieved if a strict centralization approach is chosen (Krcmar, 2015, pp. 456–457). Organizational integration is mostly found in four different basic concepts (Krcmar, 2015, p. 458), with IT being

- a subdepartment of a business process (such as product lifecycle management, supply chain management, and customer relationship management, etc.)
- a business process in itself
- an executive department
- a cross-sectional function in a matrix organization.

Naturally, hybrid setups can also be found in addition to IT departments that are set up as separate independent daughter companies with operations on a cost-plus model.

To a certain extent this organizational setups are the cause of the role of IT in the organization. Krcmar describes the CIO's role as a "conductor of an orchestra" who outlines the general direction of IT in a company. The CIO adapts requirements to the given interfaces of customers and suppliers and the individual IT sub-functions execute the directions independently according to their abilities. In some cases, the CIO gives special tasks to his units or individuals in his organization. Together with the executive management of the organization, the IT function will be able to design a future-oriented IT architecture, implement it, and in the end generate positive economic outcomes (Krcmar, 2015, p. 470). However, as conductors and orchestras vary in terms of their size, knowledge, talent, and instrumentalists, every

organization also has different prerequisites, and thus Gottschalk and Taylor (Gottschalk and Taylor, 2000, p. 1) state that "… the CIO role varies dramatically among firms in terms of background, roles, and specific IT strategies." According to Stephens et al. (Stephens et al., 1992, p. 449), it is suggested that the CIO functions as an executive rather than a functional manager. The CIO actively engages in strategic planning and serves as a liaison between the information technology group, the functional areas, and external entities.

Korhonen reports that there was a shift in the CIO role from the supply side to the demand side in recent decades Nowadays, IT increasingly plays an important role in value creation, thereby resulting in a shift of the CIO role to that of a business enabler. Especially since the emergence of digital business models, IT has become a core strategic capability for a growing number of top companies which have IT as a part of their DNA (Korhonen, 2015, p. 64).

The tasks of the IT management result to a large extent from the role of IT and its CIO. One of the first comprehensive definitions of management was provided by Fayol[4] who defined management in the following way: "To manage is to forecast and plan, to organize, to command, to co-ordinate and to control" (Pugh and Hickson, 1997, p. 95).

According to Prentice, leadership is the accomplishment of a goal through the direction of human assistants and an individual who successfully marshals their collaborators to achieve particular ends is a leader. A great leader can lead day after day, and year after year, in a wide variety of circumstances (Prentice, 2004, p. 102). Furthermore Prentice (Prentice, 2004, p. 104) states that the leader's distinctive accomplishment lies in the domain of human and social interactions. It originates from the leader's comprehension of their fellow workers and the connection between the individual objectives of these workers and the collective goal they must accomplish.

The tasks of the top IT executive have many facets, including the previously highlighted skills of leadership and management, followed by marketing, communication, and innovation.

To achieve the requirements concerning the aspects of marketing and communication, Thesmann and Burkard (Thesmann and Burkard, 2015, p. 435) state that CIOs need to excite both their team and the executive management of their company.

In the area of Information Management, based on earlier work of Wollnik (Wollnik, 1988, p. 38), Szyperski and Winand (Szyperski and Winand, 1989, 133–135), and Krcmar (Krcmar, 1991, pp. 4–18), Krcmar (Krcmar, 2015, p. 107) developed a reference model that builds on a common function and three IT-specific levels. Apart from the common management tasks for

[4] Originally published in *Bulletin de la societe de l'industrie minerale*, 1916

leading the IT organization, this includes managing information, information systems, and information- and communication technology.

IT departments can be regarded as internal suppliers that either create or purchase services and, in some cases, IT departments even act as external service providers (Durst, 2007, pp. 24–25). This is why IT departments are sometimes solely regarded as cost centers and at other times with additional profit and loss components if they operate on the external market.

According to the information technology infrastructure library (ITIL), which is a best-practice IT process framework, the IT service portfolio is the sum of all planned, active, and retired IT services (ITIL® service design, 2011). The services offered need to be innovative while simultaneously they need to match the demand of the internal customers. For this reason, IT executives need to define products and market these products, to avoid situations where customers start buying uncoordinated services from the market which, despite adding user-driven innovation, comes with different risks and challenges (Zimmermann and Rentrop, 2012, p. 60). This is why innovation and marketing are also core tasks of IT executives or, as Drucker (Drucker, 1954, p. 37) stated,

> There is only one valid definition of business purpose: to create a customer. (...) It is the customer who determines what the business is. (...) Because it is its purpose to create a [satisfied] customer, any business enterprise has two – and only these two – basic functions: marketing and innovation. (...) They are the entrepreneurial functions.

To be successful as a IT organization each employee including its leader needs to have relevant skills and competencies, as the tasks of a CIO are diverse and evolve in line with the development and digital transformation of companies. To have the right tools on hand, and to address all challenges that arise, responsible IT top managers need knowledge, competencies, and skills to do their job well by improving their efficiency and performance.

Previous work by Ravarini et al. (Ravarini et al., 2001, p. 3) identified competencies that have an impact on company performance.

In a later publication, Tagliavini et al. (Tagliavini et al., 2003, p. 5) defined a CIO profile by a set of competencies that are distinguished through three main dimensions: These are a Being Competency, a Knowing competency and a doing competency. The competency of being is built from mental, physical, and fundamental sensory attributes, as well as attitudes, value systems, and elements related to one's personal identity. The knowing competency entails an understanding of job-specific knowledge, tasks, methodologies, one's own role, the broader context, and the organization. And the doing competency involves familiarity with practices and solutions, including the technical knowledge and skills necessary for performing IT management activities.

Based on a literature review examining CIO competencies and activities, Ravarini et al. (Ravarini et al., 2001, p. 4) identified skills and grouped them to the three different competency groups. For the being competency group he assigned interpersonal skills, long term and holistic visions, effective leadership and a tendency to innovation. The knowing competency was put into the context of internal and external business knowledge, theoretical IT knowledge and managerial knowledge.

The author of this research mapped the categories found by Ravarini et al. with real life examples of job openings on the German labor market (Roscher, 2021a, p. 38) and found that a one to one application to real life examples is not possible – at least not for the German job market.

Also other scholars discussed the need of skills extensively. Thessman and Burkard reported that besides in-depth knowledge of IT, CIOs need a proper portion of business knowledge (Thesmann and Burkard, 2015, p. 435). Regarding soft or political skills primarily employed within the top management team, Enns et al. (Enns et al., 2001, p. 12) suggest that successful CIOs seem to have an advanced comprehension of the importance of effective influence and the ability to apply influence effectively on an interpersonal level.

One of the most important skills needed to be successful as a leader is communication, as it is the bases for any interaction within the organization. Without communication a successful business-IT alignment process cannot be established. Both the IT organization and the CIO are providers of technical services to user departments and, as a result, a significant part of the CIO's work involves the promotion of its services and internal relationship management with its users. The partners on both sides, namely the business and IT, need to assume responsibility and accountability and be committed to sustaining the relationship over a long time to achieve benefits (Brown et al., 1996, p. 16). Compared with other chief level managers, CIOs deal with a wider variety of issues (Jordan, 1993, p. 249) and thus the need arises for CIOs to frequently align with their customers in a repeated and structured way. One approach was first described by Hartmann (Hartmann, 1961, pp V-VII, pp 9-18) when he wrote a monograph describing the needs of IT for different industries. He described the explicit alignment process between the operative business functions and the then-available IT technology.

Reinheimer and Roba-Bissantz (Reinheimer and Robra-Bissantz, 2014, pp. 528–529) provide a comprehensive overview of business IT alignment, defining alignment requirements across all organizational business processes, including collaboration with external partners. This includes various IT domains such as:

- Strategy: IT aligns its strategy with non-IT departments, responding to the needs of internal and external customers.

- Processes: IT service process frameworks (e.g., ITIL) adopted by IT departments may impact non-IT users, while non-IT departments develop business processes, often requiring IT support.
- Infrastructure: Adaptations to IT and telecommunication infrastructure align with non-IT departments' development plans for business expansion and staff changes.
- Platforms: Reusable platforms enhance IT efficiency but may not always offer the optimal solution for user departments.
- Applications: Decisions on buying or building applications depend on user department requirements.
- Services: Defining IT services for user departments, based on IT service processes, includes first and second-level support and order processes for new hardware and software.

The main influence an IT manager has is on enterprise IT architecture, only the right will enable the business models which are operated by the business processes. IT architecture plans and controls the structure of IT in the organization (Dern, 2009, p. 18) and serves as a foundation for the higher levels such as information architecture, business architecture, and business strategy (Dern, 2009, p. 6), whereby the overall goals are the reduction of IT costs and the improvement of IT quality.

Durst (Durst, 2007, p. 94) quotes the "Enterprise Architecture Desk Reference – 2002 Edition" from the Meta Group, which is stating that the "(...) value from an EA perspective is the combination of both improved financial efficiency and improved business performance." The interdependencies outlined in this document are depicted in Figure 1-8. Even so there is no direct measurable effect of an IT system implemented on the company success, the author has the strong belief that a top-IT-Manager has different ways to contribute to the company success. The most important task is to communicate success and IT contribution to the organization and the members of the top management team. This can be done in internal communication, townhall meetings and in very successful cases also in the press or in conventions. The author also thinks that CIOs should invest in publishing their success in form of scientific case studies to allow researchers and practitioners to participate in the knowledge gained and learn by example.

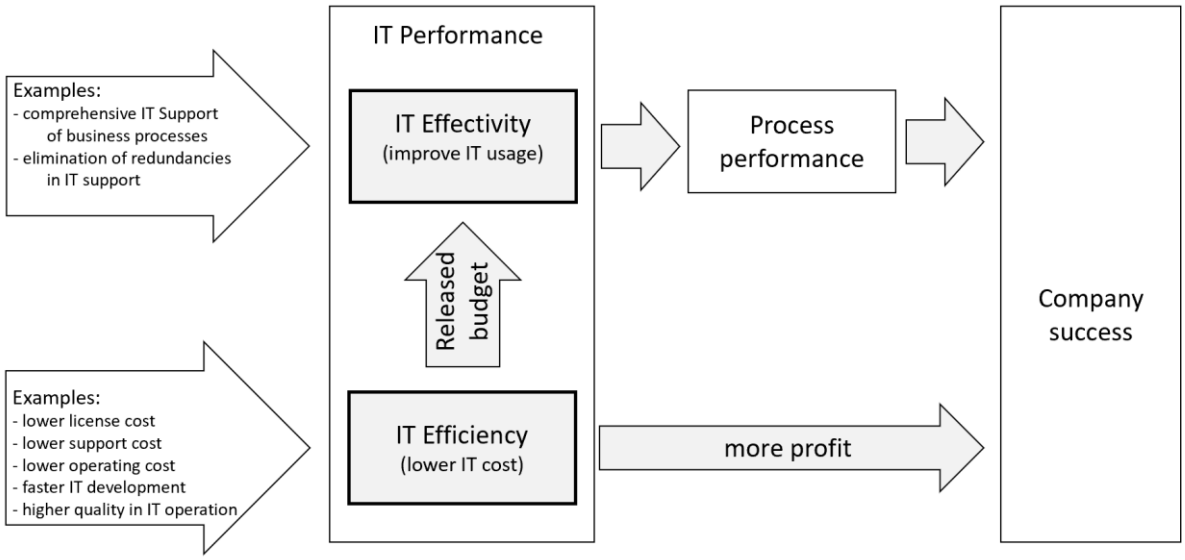


Figure 1-8: IT performance driver path for company success

Source: adapted by author based on Durst (Durst, 2007, p. 94) and Kempis and Ringbeck (Kempis and Ringbeck, 1998, p. 17)

This sub-chapter explores diverse factors influencing organizational performance in Information Technology (IT) management, particularly focusing on their connection to work-related attitudes. It begins by addressing external influences stemming from the 4th industrial revolution, introducing volatility, uncertainty, complexity, and ambiguity (VUCA) in the business environment. The need for organizations to respond with agility, information utilization, restructuring, and experimentation to counter VUCA effects is highlighted, emphasizing their significant impact on IT management and ecosystems. The discussion extends to business IT alignment and IT strategy development, emphasizing the crucial role of aligning IT strategy with business strategy and models, with Enterprise Architecture playing a crucial role.

The sub-chapter then explores the evolving role of Chief Information Officers (CIOs), who are responsible for designing and maintaining IT strategy, establishing information policies, standards, and managing information resources. CIOs are faced by different challenges, including talent management, hybrid and security concerns, business alignment, customer focus, sustainability, and technological advancements. To effectively manage and tackle these challenges, CIOs require a veriety of technical and business knowledge, along with leadership, communication, marketing, and innovation skills. The importance of IT-business alignment is partly underestimated, and a overview of business-IT alignment is provided, taking into account which impact it has on IT management.

In summary, this chapter explores the evolving role of IT management in response to external influences and highlights the challenges faced by CIOs in a rapidly changing business

landscape. It underscores the importance of aligning IT with business strategies and the need for CIOs to own a diverse set of skills to succeed in their roles.

1.4. Identifying research gaps in top IT management studies

In the past decades, IT management and CIO effectiveness has been researched from different angles. Even so, the amount of research is limited. Only a few publications are based on quantitative research methods of the complex relationships and influence factors in this management area. Many researchers in the field of business informatics use qualitative research methods.

Therefore, a structured literature review has been done with the aim to identify all publications which deal with the Role of the CIO within organizations. A total of 82 publications were analyzed in two different ways.

In a first step all publications, where title, abstract and keywords where available were screened to identify the nature of the publication. The publications (n=82) were grouped into five main categories where possible: “CIO-C-Level relationships and communication” (n=28, published between 1993 and 2022), “CIO background, traits, skills, competencies, roles and responsibilities” (n=24, published between 1992 and 2022), “organizational performance” (n=16, published between 1994 and 2021), “Strategy and business IT alignment” (n=4, published between 2005 and2021), “career development” (n=5, published between 1989 and 2019) as well as ”CIO compensation” (n=3, published between 2008 and 2022), The aim was to investigate fields of previous research of other scholars in this area and potential research gaps. Additionally the publications were grouped according to the publication type, journal, proceeding or book, and the research methodology. This revealed that many publications used interviews, secondary data from accessible databases and no to forget matched pair interviews or surveys. Only two studies were meta studies. The complete list is attached in Appendix A.
As a result of this study, it can be stated that CEO-CIO interactions play an important role in the previous research. The topics of Strategy and business IT alignment as well as compensation and incentives are little investigated. This leads to the conclusion that the CEO-CIO interaction plays a significant role for the occurrence of organizational performance, which in turm is influenced by work motivation and job satisfaction. Therefore the author decides that certain aspects of this principal agent interaction should be researched in more detail. Especially the influence of perceived mutual understanding, the agent trust in the principal and the principals’ IT knowledge effect on CIO attitudes has not been researched up to now.

Additionally CIO research has not put much emphasis on the effect of performance management and monetary incentive systems on CIO attitudes.

Finally no publication reflects the effect of the business IT alignment process on the CIOs attitudes work motivation and job satisfaction.

The second analysis of the available CIO literature was conducted with the aim to find which measurement constructs and variables scholars have utilized to explain interactions of CIOs in companies. Therefore only publications, which were based on quantitative research utilizing structural equation models were identified by proofreading the publications. All other publications have not been considered for analysis. The process of literature selection was executed using the PRISMA-P method as described in Appendix B based on the ScienceDirect database and additional literature obtained by forward and backward reference research (Hinde and Spackman, 2015, pp. 5–11).

In the second step, keywords have been extracted by the author from the selected papers (n=13) and then used for further analysis. A total of 27 keywords have been found in 11 publications. Consequently, the keywords have been aggregated and grouped together for analysis. The results are shown in table 1-5.

Table 1-5: Keywords from relevant publications aggregated for further analysis

Aggregated keywords	Keywords used by authors in selected publications*
Generic keywords (CIO/IT)	CIO, IT
Role specific keywords	CIO characteristics, CIO capability, CIO role, CIO role effectiveness
Interaction and strategic importance of IT	CIO and top management team, CEO/CIO alignment, business strategic alignment, IT centrality, organizational integration
Person of CIO	Personality traits, socialisation, competence / background
Work of CIO	IT Management (model), IT strategic leadership, IT Strategy / Vision
Outcome IT	IT quality, IT management value, IT contribution
Outcome company:	Financial performance, organizational performance, organizational benefits, competitive capabilities, cooperative capabilities, performance

*Keywords extracted from: (Enns, Huff & Golden , 2003),(Smaltz, Sambamurthy & Agarwal , 2006),(Li et al. , 2006), (Sobol & Klein , 2009), (COHEN & DENNIS , 2010), (Johnson & Lederer , 2010), (Chen & Wu , 2011), (Li & Tan , 2013), (Ding, Li & George , 2014), (Ricciardi, Zardini & Rossignoli , 2018), (Paré, Guillemette & Raymond , 2020).
Source: author's own grouping of keywords

These aggregated keywords have then been matched back to the selected publications, taking into account that two papers from Ravarini et al**.** (Ravarini et al., 2001) and Chen and Preston (Chen and Preston, 2007) did not contain keywords.

In a next step, the keyword have been used to categorize the selected publications regarding their content. Table 1-6 shows the scope of the individual publications in relation to the aggregated keywords and in addition ranks the aggregated keywords according to their appearance in the selected literature sample.

Table 1-6: Research scope of individual publications based on keyword analysis and ranking of aggregated keywords

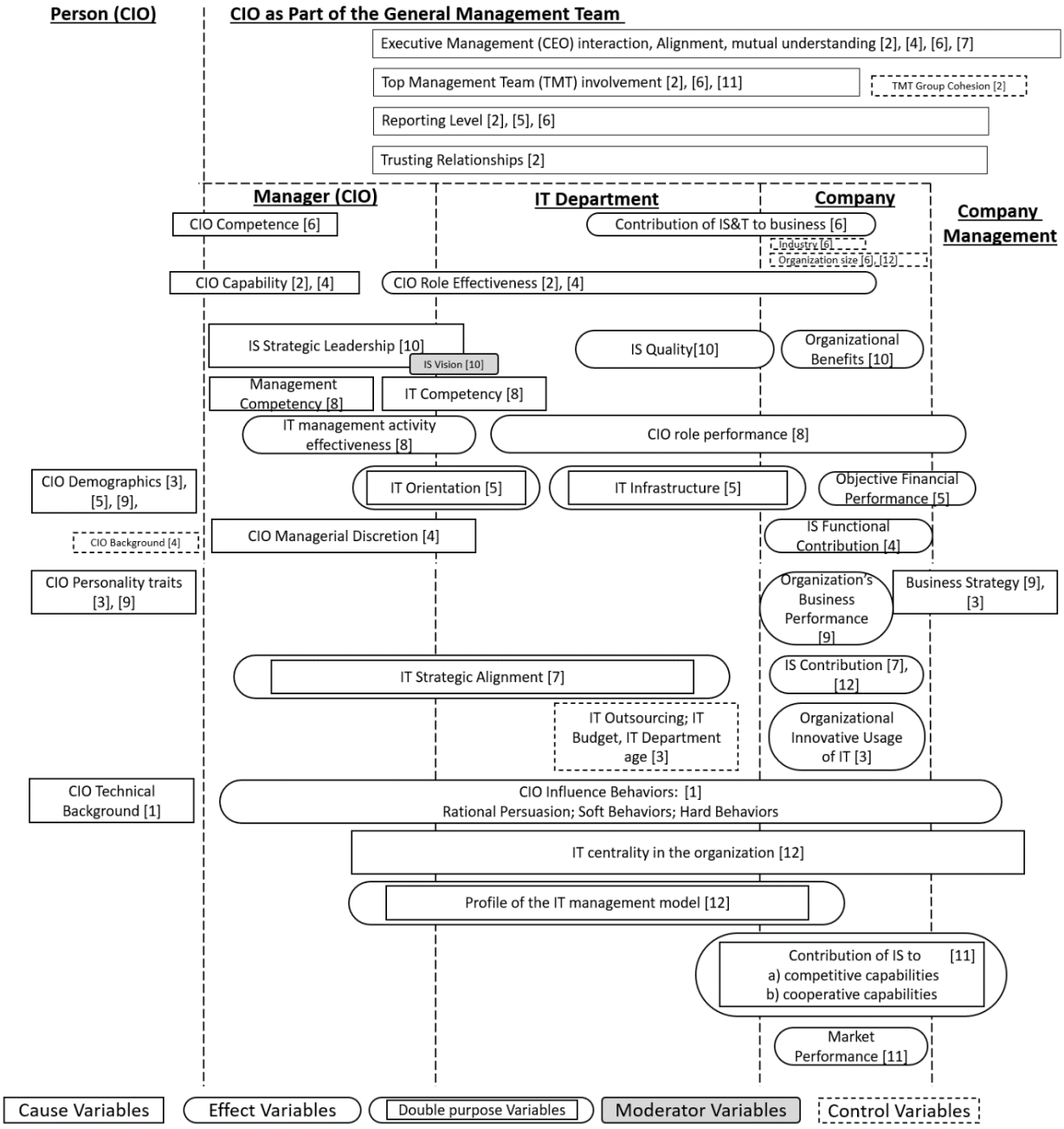
References (Publications with no keywords are excluded.)	CIO / IT	Work of CIO	Interaction and strategic importance of IT	Outcome company	Person (CIO)	CIO role	Outcome IT
(Enns et al., 2003)	x	x			x		
(Smaltz et al., 2006)			X			x	
(Li et al., 2006)	x				x		
(Sobol and Klein, 2009)	x	x		x			
(Cohen and Dennis, 2010)	x	x	X	x	x		
(Johnson and Lederer, 2010)		x	X				x
(Chen and Wu, 2011)	x	x			x	x	
(Li and Tan, 2013)			X	x	x	x	
(Ding et al., 2014)		x		x			
(Ricciardi et al., 2018)	x		X	x			x
(Paré et al., 2020)	X	x	X	x			
Frequency	7	7	6	6	5	3	2
Percentage	63.6%	63.6%	54.5%	54.5%	45.5%	27.3%	18.2%

Source: author's analysis and calculations based on structured content analysis

The analysis clearly shows that previous research has focused on the work of a CIO, the necessary interactions within the company, and the strategic importance of IT on the outcome for the company as a whole (>50% of the publications). The impact of the CIO as a person and his role in the company is investigated in less than 50% of the papers. The outcome on IT which is the only direct cause-effect relationship is only researched in 2 papers.

In order to gain a holistic view, the research models of different researchers have been structured in 6 dimensions: "Person (CIO)", "Manager (CIO)", "IT Department", "Company", "Company Management and CIO as part of the General Management Team (top management team)". Some variables investigate different areas at the same time, which resulted in the need for a graphic overview shown in figure 1-9.

The depiction shows that a CIO has a wide field of responsibilities and various areas of actions within a company's organization, which needs a personality that covers besides technical also analytic, adaptive, agile, political, communicative, strategic, goal-oriented and solution-orientated competencies. This is fully in alignment with the analysis of competencies done by Ravarini et al. (Ravarini et al., 2001).



Reference Codes used in Figure 4: [1]: (Enns et al., 2003); [2]: (Smaltz et al., 2006); [3]: (Li et al., 2006); [4] (Chen and Preston, 2007); [5]: (Sobol and Klein, 2009); [6]: (Cohen and Dennis, 2010); [7]: (Johnson and Lederer, 2010); [8]: (Chen and Wu, 2011); [9]: (Li and Tan, 2013); [10]: (Ding et al., 2014); [11]: (Ricciardi et al., 2018); [12]: (Paré et al., 2020).

Figure 1-9: Research variables in relation to company structure

Source: author's construction (Roscher, 2021b, p. 358)

The overview shows clearly that measurement constructs in the selected CIO research involved commonly used variables like competence, capability, skills, background, personality traits and demographics. The absence of variables as work motivation and job satisfaction leads to the decision of the author to use these constructs for the first time in CIO research as dependent variables. The fact that previous authors also used principal agent model related measurement constructs like interaction, alignment and mutual understanding as well as trusting relationships

strengthens the decision to use these as either independent or moderating variables in this research.

This chapter describes what effect external influences have on IT organizations, which role CIOs play in these organizations, what their tasks are and which challenges they face in fulfilling their role. To understand how they act in their role and interact with their supervisors, peers, employees and other stakeholders two management theories (upper echelon and principal-agent) were more closely examined including some possible influence factors (mutual understanding, strategic alignment and trust) on the interactions between managers and their supervisors. Finally the question of how work motivation and job satisfaction influence organizational performance was elaborated.

2. DETERMINING FACTORS INFLUENCING WORK MOTIVATION AND JOB SATISFACTION

The multifaceted role of Chief Information Officers (CIOs), as defined by Synnott and Gruber (Synnott and Gruber, 1981, p. 66), involves not only formulating information policy but also managing information resources. This critical role has been proven essential for organizational success, with studies demonstrating the positive impact of CIOs on company performance. CIOs can enhance both IT efficiency, reducing costs, and IT effectiveness, improving technology use. Business-IT alignment (BITA) emerges as a key responsibility, linking IT initiatives with business objectives and adapting to external influences.

This chapter will focus on diverse influencing factors within the company that affect Chief Information Officers' work-related attitudes. First, an overview regarding previous research on the role of CIOs is provided. Then, potential confounding factors stemming from IT operations will be examined. Subsequently, interpersonal factors will be investigated, emphasizing communication and alignment between executive management and top IT managers. This entails scrutinizing formal processes like business-IT alignment and establishing mutual understanding. Afterward, procedural factors, including performance management and monetary incentive systems commonly present in operations, will be investigated. The final part aims for a profound understanding of social needs and hygiene factors, unraveling how trust and knowledge influence work-related attitudes, work motivation, and job satisfaction of top managers.

2.1. Previous research on the role of Chief Information Officers

Numerous studies underline the indispensable role of Chief Information Officers (CIOs) in organizational success. Durst (Durst, 2007, pp. 93–95) establishes that CIOs positively influence company performance by fostering IT efficiency, leading to cost reduction and increased profitability. Schweda and Schmidt (Schweda and Schmidt, 2014), Marrone and Kolbe (Marrone and Kolbe, 2011), and Hodgkinson (Hodgkinson, 1992) propose measures such as tailored IT management systems and efficient IT service management frameworks to drive IT efficiency. Additionally, Chan et al. (Chan et al., 2006) emphasize the importance of a robust budgeting and controlling process to ensure planned technology investments deliver desired outcomes. Tallon (Tallon, 2014) highlights the role of CIOs in supporting business processes with appropriate information technology to improve IT effectiveness.

CIOs' primary responsibility, as Peppard (Peppard, 2010) underscores, is to ensure "Business-IT-Alignment" (BITA), where strategic information technology initiatives drive business

performance. Ward and Peppard (Ward and Peppard, 2002) advocate capturing external and internal influences necessitating changes in business models or company strategy into IT strategy. The literature extensively discusses the CEO-CIO relationship (Benlian and Haffke, 2016; Chen and Preston, 2007; Jones et al., 1995) and emphasizes the importance of CIOs being members of the top management team (Georgakakis et al., 2019; Lee et al., 2014; Ling et al., 2015) Whitler et al. (Whitler et al., 2017) and Taylor & Vithayathil (Taylor and Vithayathil, 2018) explore the alignment between the CIO and other top management team members.

Gurbaxani & Kemerer (Gurbaxani and Kemerer, 1990)suggest viewing these top management relationships through the lens of principal agency theory. The evolving IT landscape, as witnessed since the 1990s, emphasizes the shift from centralized IT delivery organizations to decentralized demand-driven IT management systems, raising governance challenges. Smaltz et al. (Smaltz et al., 2006) establish that the inclusion of CIOs in the top management team and trust-based relationships positively correlate with CIO effectiveness.

Peppard (Peppard, 2010) provides an insightful anecdote, highlighting the need for CIOs to be seen as trusted team members, not merely supporters. The story emphasizes that CIOs should be business and technology visionaries, capable of addressing challenges arising from changes in business strategy and evolving business models with the support of new IT technology.

In summary, literature underscores the multifaceted role and importance of Chief Information Officers within organizations, ranging from defining information policy to managing information resources. CIOs significantly impact organizational performance by enhancing IT efficiency and effectiveness, ultimately ensuring Business-IT Alignment. The CEO-CIO relationship, CIO inclusion in the top management team, and their ability to navigate challenges emerge as critical factors influencing CIO effectiveness. This thesis aims to explore these influencing factors, comprehensively understanding their impact on the work-related attitudes of top IT managers, including work motivation and job satisfaction.

2.2.Factors within IT organizations

Within this research factors originating from IT organizations that can influence the effectiveness and performance of IT departments have been identified. These are important as they might have influence on work motivation and job satisfaction. The first factor is the leadership span of an CIO, the second factor IT effectivity and third factor is the use of IT key performance indicators.

Leadership span

The concept of leadership span is discussed in various cultures and times for more than 2000 years. According to van Fleet and Bedeian (van Fleet and Bedeian, 1977, p. 357) reports about

leadership span considerations in the roman empire by Caius Marius but also in the ancient civilizations in Europe, China, and India. They also cite Napoleon I “No man can command more than five distinct bodies in the same theatre of war” and Clausewitz (approx.. 1830) “Plainly … one person can only exercise direct command over a limited number. If there are more than ten parts, a difficulty arise in transmitting orders with the necessary rapidity and exactitude.”. Fayol (1916) is cited “Whatever his level of authority, one head only has direct command over a small number of subordinates less than six normally. Only the … foreman or his equivalent … is in direct command of twenty or thirty men, when work is simple.”

Many other suggestions of the optimal leadership span have been suggested by practitioners and researchers in the span from 3 to 10 in complex environments and up to 30 in areas with simple tasks. Therefore Haimann and Scott (Haimann and Scott, 1970; van Fleet and Bedeian, 1977, p. 362) concluded in 1970 that “There is … no definite, fixed answer to the ideal number of subordinates a manager can effectively supervise.” Davisonson (Davison, 2003, pp. 22–23) reported for the year 2001 in her paper about a median management ratio (leadership span) among all participants of 7.02 in companies with 1-500 employees 4.27, in companies with 20001-5000 employees 9.29 and in the information industry 4.98 based on data from an external research organization. Overall van Fleet (van Fleet, 1983, p. 551) concludes in exploratory research that not leadership span or unit size should be of foremost concern. Rather the criteria of effectiveness or productivity should be taken into more consideration. For the current research, the decision was therefore taken to both investigate the leadership span as confounding variables.

The author believes, based on own experience and observation that CIOs should have between 4 and 6 direct reports. This comparably low leadership span allows the top IT manager to focus on the foundation of every successful IT organization, IT strategy, governance, processes and architecture. A higher leadership span come with more management tasks and day to day work prohibiting the top IT manager from doing value adding work.

IT Effectiveness

The IT effectivity is measured by measuring the tasks an IT department executes which in turn is dependent on the business requirements. Krcmar (Krcmar, 2015, p. 7) has developed a reference model of IT management which gives a structured overview of the tasks of an IT organization. In an attempt to validate and amend this reference model Roscher and Brink (Roscher and Brink, 2020, pp. 4–5) analyzed job advertisements in Germany and found that employers expect additional tasks to be done by CIOs. The amended model is shown in figure 2-1.

Management role of IT organization
(Resource: Employees)

	Job titles				
Task:	***total***	CIO (8)	ITM (22)	ITL (37)	OIT (12)
IT strategy	***39%***	38%	27%	59%	33%
IT governance	***19%***	38%	27%	11%	17%
IT processes	***47%***	63%	41%	41%	42%
IT human resources	***57%***	50%	36%	70%	58%
IT controlling	***20%***	25%	27%	14%	25%
IT security, IT risk mngm.	***29%***	13%	0%	43%	25%
Data security/protection	***24%***	0%	23%	35%	8%
Additional tasks according own research:					
Supplier coordination / IT sourcing	***54%***	38%	41%	65%	58%
Budgeting	***33%***	25%	36%	32%	33%
IT architecture	***51%***	50%	32%	70%	33%
Project management	***58%***	25%	50%	68%	58%
Consulting / demand management (top level)	***38%***	38%	27%	54%	33%

Management of Information
(Resource: Information)

Availability
Demand
Usage

	Job titles				
Task:	***total***	CIO (8)	ITM (22)	ITL (37)	OIT (12)
Management of information	***5%***	0%	14%	3%	0%

Management of Information Systems
(Resource: Applications)

Data
Processes
Application Lifecycle
Application Landscape

	Job titles				
Task:	***total***	CIO (8)	IT M (22)	ITL (37)	OIT (12)
Management of information systems	***66%***	75%	50%	70%	67%

Management of Information and Communication Technology
(Resource: Infrastructure)

Storage
Processing
Communication
Technology Stack

	Job titles				
Task:	***total***	CIO (8)	IT M (22)	ITL (37)	OIT (12)
Management of I&C technology	***85%***	50%	82%	86%	92%

Figure 2-1: Tasks of IT organization and representation in job ads (N=79) by job titles

Source: Authors own construction based on content analysis published in a conference paper (Roscher and Brink, 2020, p. 5)

According to the findings, Krcmars' reference model had to be extended with new additional tasks as these were consequently mentioned in the job ads as important. These tasks can be clustered into:

a. finance & administration (supplier coordination / IT sourcing and budgeting).
b. innovation & architecture (IT architecture and IT trends and technology).
c. business-IT-alignment (project management[5], consulting/demand management on management level, cooperation with others, IT effectivity)

Summarizing the results of Roscher and Brinks structured content analysis of job advertisements, the following statements can be proposed:

1. traditional tasks of IT organizations as postulated by Krcmar can be confirmed. Yet, showing that the area of the "management of information" is not requested frequently by employers.
2. additional tasks which have been clustered by the author into the groups "finance & administration", "innovation & architecture" and "business-IT-alignment" are frequently requested by the employers.

Based on this widened task list from Krcmar and own research and previous work from Hanschke, Kempis and Ringbeck, Durst and Termer a model was a used for controlling for the

[5] *Milosevic & Srivannaboon suggest that project management is a tool to align IT to business strategy Miloševic and Srivannaboon (2006).*

confounding factor of IT effectivity as it is defined by Durst and shown in Figure 2-8.

This is in detailed based on Hanschke, who describes four levels of significance (Hanschke, 2010, pp. 11–13) of the IT department's role in the enterprise. These are IT as cost factor, IT as an asset, IT as a business partner, and IT as an enabler.

Kempis et al. (Kempis and Ringbeck, 1998, pp. 20–24) defined four archetypes of IT organizations (IT layman, IT cost savers, IT snob, and IT professionals) and investigated these groups in regard to the success of companies. Their results show that companies that are clustered among the “IT professionals” grow faster and are more profitable. He also introduced two today commonly used IT success terms, namely IT efficiency and IT effectivity. IT efficiency is mainly linked with the IT cost position and the efficiency of IT project execution. This has a direct impact on the overall cost positions of the company which in turn has an effect on the company's performance. IT effectivity is linked to process-specific IT indicators like functionality, availability and usage, and usability. IT efficiency affects company performance by enhancing process performance. Durst (Durst, 2007, pp. 93–95) supplemented this with a literature review on examples from research, supporting the findings of Kempis et al. Termer (Termer, 2015, pp. 148–150) operationalized the IT effectivity of the IT departments’ offerings

In conclusion, it can be stated that the tasks are the foundation that enables the IT organization to fulfill its business in terms of being efficient (cost aspect) or also being effective by providing support for raising the efficiency of business processes. Yet, only if the leader of the IT organization, the CIO, goes beyond these basic tasks and concepts they can develop into being a real business partner or an enabler for the rest of the organization.

Key performance indicators

Key performance indicators are widely used in business to measure, control and improve performance. Binder (Binder, 2023, Chapter 4.2) states “The primary goal of strategic corporate management is to secure the company’s long-term existence. For this purpose, long-term and forward-looking planning must be carried out and the expected future developments in the environment influencing the company must be considered.” Key figure systems or key performance indicators can support this. The term “key figure system” is not defined uniformly in the literature. Nevertheless, the same four characteristics that make up a key figure system are repeatedly mentioned in a large number of definitions. These are shown in Table 2-1. As described above, key figures form the basis of the key figure system and enable the company to be planned and controlled. Basically, the task of key figures is to quantify facts and to present information or measured variables in aggregated form.

Table 2-1: Definitions of key figures in literature - results from literature review

	Definition			
Definition of Key Figures	Key figure systems as the linking and connection of key figures	Key figure systems as a transparent representation of company performance using monetary and non-monetary key figures	Key figure systems as a basis for decision-making	Key figure systems as a safeguard for the implementation of the corporate strategy
(Neely et al., 1995)		x		
(Mathur et al., 2011)		x		x
(Kleindienst, 2017)		x		x
(Ossola-Haring et al., 2016)	x	x		
(Brunner, 1999)		x		x
(Bourne et al., 2000)		x		x
(Garengo et al., 2005)		x	x	
(Chalmeta et al., 2012)		x	x	
(Kueng and Wettstein, 2001)		x	x	
(Brecht, 2012)	x	x		
(Bititci et al., 1997)		x		
(Gladen, 2014)	x	x		

Source: own literature review as published in conference paper (Höpfner and Roscher, 2021, p. 65)

This is made possible by the fact that key figures are quantitative information that is prepared for the specific needs of company analysis and control (Ossola-Haring et al., 2016) (Gladen, 2014, p. 9) (Kleindienst, 2017, pp. 40–41) (Weber, 1998, pp. 217–219). On closer inspection, key figures can be distinguished concerning their type of calculation, i.e. whether it is an absolute or relative key figure (ratio key figure). In addition, they can be structured according to content criteria for a better overview(Ossola-Haring et al., 2016, p. 67). In addition to the term “key figure”, there are also so-called “indicators”, which are often used in the literature as a synonym for the key figure. It is important to distinguish between these. Indicators are not condensed information, but substitute values that give tendencies towards the development of a performance level enable. They are also not self-explanatory and require interpretation (Weber, 1998, pp. 217–219) (Gladen, 2014, pp. 9–10).

This distinction will be retained for the following course of the work because indicators should be largely dispensed with in the interests of a comprehensible and interpretation-free system of indicators.

A special definition must be made for key performance indicators (KPIs). KPIs are used when it comes to measuring objectives within the company. A KPI shows the degree of fulfillment

of certain objectives or the deviation from the respective target value. A key figure, on the other hand, is a measurable value (Richert, 2006, p. 31).

In the case of KPI usage by IT departments, it's crucial to note the absence of standard KPIs due to diverse organizational objectives. However, frameworks like ITIL suggest specific fields for application. For an IT organization, it is essential to determine the extent to which they measure the efficiency of internal processes across dimensions such as IT service management (operations), project management, financial IT management, and IT customer satisfaction. In implementing IT service management frameworks like ITIL, the maturity of processes is measured at different levels, with Critical Success Factors and key performance indicators employed from level 4 onwards to evaluate process health.

Researchers suggest approaches on how to set up such systems (Neničková, 2011, p. 843) and others study empirically the impact of IT service management frameworks on the IT organization regarding benefits, challenges, and processes (Marrone and Kolbe, 2011, p. 16).

The optimal number of subordinates a manager can effectively supervise, has been discussed for centuries. Yet, there's no definitive answer on the topic of the right leadership span. Research suggests that organisations should prioritize effectiveness and productivity over a specific span. Krcmar's IT management model is influenced by IT effectiveness which is closely linked to business requirements. The author of this theses as identified additional tasks coming from job advertisements. They fall into the area of IT finance, administration, innovation, architecture, and business-IT-alignment. The IT efficiency and effectivity have a great impact on the company performance.

Key performance indicators (KPIs) are widely used by companies and are important for measuring company objectives. They can be absolute or relative and they can be categorized based on content criteria. For IT departments, diverse organizational objectives result mostly in non standard KPIs, apart from KPIs which com from standardized process frameworks like IT ITIL or IS0 20000. These KPIs provide insights into IT operations, project management, financial IT management, and IT customer satisfaction.

2.3.Factors arising from principal-agent interactions

This sub-chapter will explore the details of trust and collaboration within a principal and agent relationship. It explores four key factors, covering aspects. The author first begins by examining the aspect of the agents trust in the principal, followed by an investigation of mutual understanding between supervisor and subordinate manager. Then the author then lookes into the existence of business IT alignment practices to examine the importance of effective

cooperation. Finally, the importance of the principal's knowledge about the agent's work is investigated.

Trust in principal and agent relationships

Not only CIO literature stress that trust is essential for the principal agent relationship (Arnitz et al., 2017, p. 85). Also general literature investigates trust in the management field. Trust, as defined by Bligh (Bligh, 2017, p. 22), is characterized as the expectation or belief that one can depend on the actions and words of another person. Interpersonal trust between supervisors and subordinates have according to earlier research impact on organizations. This includes performance, communication and cooperation. Whitner at al. (Whitener et al., 1998, p. 513) came up with a definition which is three fold. The exception that the other party will act friendly, secondly that control of fulfillment of this expectation cannot be guaranteed and thirdly that there is always a certain dependency on the other party. Attitudes which persons have, trigger in day to day life certain behaviors. Among these behaviors some support the development of trust in the subordinate. Whitener et al. (Whitener et al., 1998, p. 516) named behavioral consistency and integrity, sharing and delegation of control, open and accurate communication and demonstration of concert as key factors. These factors might be moderated by cultural and individual values of both managers and employees.

While many scholars have investigated the aspect of trust from the principial in the agent only view have looked at the aspect of trust in leaders. Among them is Mishra (Mishra, 1996, pp. 6–7)which connects the managerial factors competence, caring, openness and reliability to the building of trust. Dirks and Ferrin (Dirks and Ferrin, 2002, p. 613) have developed a complex model which includes many factors from both interpersonal and organizational perspectives. Figure 2-2 demonstrates the framework of trust in leadership.

Within their research Dirks and Ferrin suggest that trust mediates between antecedents and consequences in relationships (Dirks and Ferrin, 2002, p. 623). Also Podsakoff et al. (Podsakoff et al., 1990) investigated trust as a mediator on Organizational citizenship behavior.

Bruke et al. (Burke et al., 2007, p. 627) investigated how trust is influenced. They found that that trust might be influenced by discussions in the team, processes and policies. This might create a kind of shared trust of the team members towards the leader. Besides these direct influences also indirect factors like passive observation of leaders behavior and interactions with other individuals. Matzler and Renzl (Matzler and Renzl, 2006, p. 1261) showed in their research that trust in colleagues and trust in management are strong predictors of employee satisfaction.

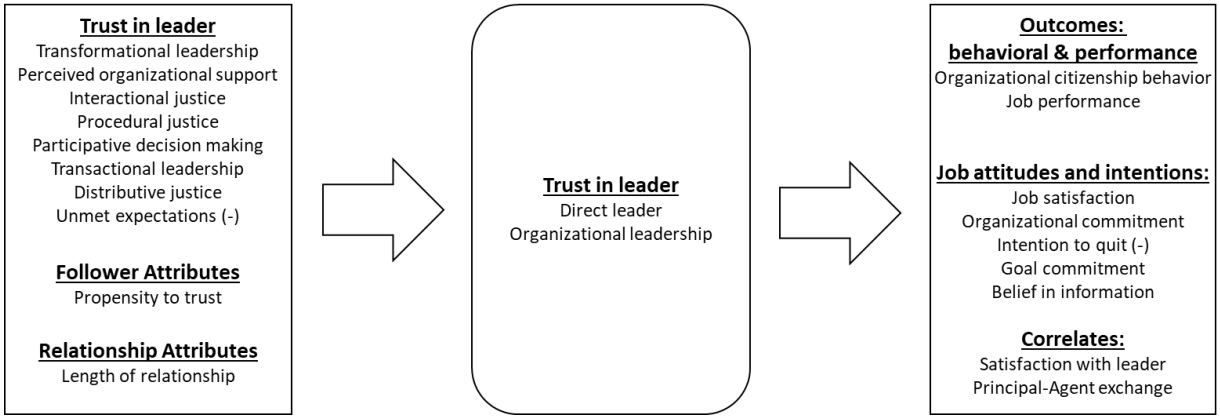


Figure 2-2: Framework of trust in leadership

Source: Authors own construction adapted from Dirks and Ferrin (Dirks and Ferrin, 2002, p. 613)

Yet they also found that trust in team members have a stronger impact that trust in the leaders. Drivers of trust have been described by Abrams et al. (Abrams et al., 2003, p. 67) with suggestions on how to improve managerial behaviors, individual factors of leaders, organizational factors, and rational factors that promote trust. Yet, they pointed out that each organization is unique and that it is therefore necessary to adapt the measures to the culture of the organization (Abrams et al., 2003, p. 74). Stern and Coleman (Stern and Coleman, 2014, p. 122) also describe the affinitive form of trust which they describe as dependent from shared values, feelings experiences and identity. Yet they also describe among others procedural trust in systems or processes. Due to the fact that leaders typically are responsible for setting such procedures, policies or processes into action there might also be a strong indirect influence of affinitive trust as a part of the described procedural trust. Yet trust is not a static attitude. In the case of abuse or other incidents in the relationship between the truster and the trustee trust might be reduced or even completely lost or even turn into mistrust. Vanneste et al. (Vanneste et al., 2014, p. 1898) have investigated in a meta-analysis of 39 studies how trust develops over time. One of their findings is that trust between individuals are based on initial beliefs. Trust may increase while they learn about each other. Yet, with the limitation that pessimistic initial beliefs about trustworthiness were present. Employees need to have trust in their leader this applies not only in military settings but also for other types of organizations. According to Brower et al. (Brower et al., 2009, p. 343), leaders and subordinates are considered partners in a social exchange, and when either member of this pair experiences a deficiency in trust, it becomes challenging to fully realize the potential benefits that can emerge from this relationship. Situations that are challenging and sometimes delicate, such as a change in company structure or downsizing, can put executives into the challenge to uphold and to continue the trust which they receive from their employees (Kraus and Kreitenweis, 2020, p. 151). Regardless of

whether a company's situation is difficult or not, agents are happier at work and more committed to the company when they can trust their principal. This relationship of trust also encourages the agents to execute their tasks more committed and to support their peers (Yang and Mossholder, 2010, p. 60). The relationship between management and performance is also investigated by Mayer and Gavin (Mayer and Gavin, 2005, p. 883) indicating that trust affects employees ability to focus attention on value-producing activities. Other scholars have researched different aspects of trust like the influence of relationship duration on trust (Vanneste et al., 2014, pp. 1898–1899).

In regard to the influence of trust on the principal and agent relationship Ensminger (Ensminger, 2001, p. 86) states that trust moves relationships from a contractual one to a more trusting one. This has the consequence of looser account-keeping and less direct monitoring of the daily performance of the agent by the principal. Brower (Brower et al., 2009, p. 343) suggests that organizations need to take steps to increase trustworthiness, yet this process of building trust involves the reduction of information asymmetry and by this the empowerment of employees. He postulates that this puts principals in a more vulnerable position.

A suggestion to research trust in executives as a moderating variable was given by Ötken and Cenkci (Ötken and Cenkci, 2012, p. 535)as they see a lack in this area. Building on a trustful relationship Supervisors and subordinates, in this case CEO/CIO need to develop mutual understanding which is the bases for successful cooperation in favor for the company. Kim and Park (Kim and Min Park, 2014, p. 76) showed that interpersonal trust enhances job satisfaction by helping agents to overcome conflicts and problems and Crawshaw (Crawshaw, 2011, p. 159) described trust as the explanatory factor that binds the employment relationship together.

To draw a complete picture of trust it is needed to mention that an additional perspective on trust is discussed in literature. This is trust in the functioning of an organization, which has been investigated by scholars before (Holtz, 2013; Kaltiainen et al., 2018; Puusa and Tolvanen, 2006; Wong et al., 2006). Yet for this research the main focus is the trust relationship within the principal agent system as it is assumed that without a sufficient level of trust between these actors an agent cannot develop trust towards the organization.

The discussion on trust in the context of principal-agent relationships and leadership is essential in both CIO literature and general management studies. Trust is defined as the expectation or belief in the reliability of another person's actions and words. Interpersonal trust between supervisors and subordinates has been shown to impact organizational outcomes, including performance, communication, and cooperation. Whitener et al. (Whitener et al., 1998, p 513, p 516) identified key factors contributing to the development of trust, such as behavioral consistency, integrity, sharing and delegation of control, open and accurate communication,

and demonstration of concern. These factors can be influenced by cultural and individual values of both managers and employees. Many researchers have focused on trust from the both sided principal-agent perspective additionally scholars have also explored trust of employees in their leaders. Mishra (Mishra, 1996) connected managerial factors such as competence, caring, openness, and reliability to the building of interpersonal trust. Dirks and Ferrin (Dirks and Ferrin, 2002, p. 213) developed a comprehensive model which considered interpersonal and organizational factors that influence trust in leadership.

Factors that influence trust can range from team discussions and business processes to passive observations of leaders' behavior and interactions with others.

Research indicates that trust in colleagues and trust in management predict the satisfaction of employees. Yet, trust in team members often having a stronger impact than trust in leaders. Drivers of trust include improving managerial behaviors, individual leader traits, organizational factors, and rational factors. But these must be adapted to the unique culture of each organization. Trust is not static and can be changed by incidents which might turn into mistrust. Research suggests that trust develops based on initial beliefs and trust increases as individuals learn more about each other. The trust of employees in their leaders is crucial for maximizing outcomes and commitment in organizations. This is especially true during challenging situations such as structural changes. Trust encourages employees to perform tasks more better and support their colleagues, which affects the overall performance.

In conclusion it is the belief of the author, that trust is a fundamental element in both principal-agent relationships in specific and leadership of companies overall. Trust is not a one-size-fits-all concept; it can be influenced by various factors such as including individual values, organizational culture, and specific behaviors of leaders and team members. The importance of trust extends beyond routine operations and is particularly crucial during challenging times, such as organizational changes or crisis. Leaders must work to build and maintain trust among their employees, as it empowers individuals to perform their tasks more effectively and fosters a collaborative and supportive work environment.

Mutual understanding

Peppard (Peppard, 2010, p. 86) states that without strong relationships between the CEO, top management Team, and the CIO, the CIO is likely to struggle. Based on the literature selection depicted in Figure 2-2 the papers with relevant research constructs (n=19) have been analyzed according to used constructs investigating the CEO-CIO relationship. Table 2-4 gives an overview of the used constructs and which role they played in the research:

Table 2-2: Results of literature review regarding usage of CEO/CIO relationship in CIO research

Authors	Construct	usage in research model
(Feeny et al., 1992)	CEO/CIO relationship	interview
(Smaltz et al., 2006)	Formal interaction with the CEO	cause variable
(Preston et al., 2006)	CIO/top management team shared understanding	effect variable
(Johnson and Lederer, 2006)	CEO/CIO convergence on the role of IT	cause variable
(Chen and Preston, 2007)	CEO/CIO shared understanding of IT role	cause variable
(Cohen and Dennis, 2010)	CIO interaction	cause variable
(Peppard, 2010)	CIO relationship with CEO	interview
(Johnson and Lederer, 2010)	CEO/CIO mutual understanding of the role of IT	cause variable
(Benlian and Haffke, 2016)	Bilateral nature and effects of CEO-CIO mutual understanding	matched-pair

Source: Authors' own construction.

Johnson and Lederer (Johnson and Lederer, 2006, p. 53) found that a mutual CIO/CEO convergence of the current role of IS in the organization positively influences the financial contribution that IT makes to the organization.

In general Stolk et al. (Stolk et al., 2016, p. 181). define mutual understanding as follows

> "…when different minds mutually infer they agree on an understanding of an object, person, place, event, or idea…"

They also refer to the need for a conceptual alignment to achieve mutual understanding and define conceptual alignment as

> "… condition in which individuals' mental representations have become aligned, or sufficiently compatible, despite those individuals' idiosyncratic experiences and knowledge structures."

CEO–CIO mutual understanding was researched by Benlian and Haffke (Benlian and Haffke, 2016, p. 115) who show that the CIO's understanding of the CEO outweighs the importance of the CEO's understanding of the CIO as the CIO's understanding of the CEO has a central role in forecasting the quality of the joint collaboration.

Mutual understanding and strategic alignment

Several scholars have investigated the topics of mutual understanding and strategic alignment between CIOs, their superiors (e.g. CEO or CFO), and their colleagues on the TMT level.

Preston developed a concept of how IT strategic alignment could be fostered. Important foundations in his model are, on the one hand, the educational role of the CIO and on the other hand, the demographic similarity between the CEO and CIO. These two aspects enable a shared mental model between the CEO and CIO, which in turn fosters IT strategic alignment (Preston, 2003, p. 3377).

Johnson and Lederer found that more frequent communication between the CEO and CIO should increase the mutual understanding of the current and future impacts of IT in the company (Johnson and Lederer, 2009, p. 206).

Furthermore, the hierarchical position of the CIO in the company also influences the CIO/CEO's communication effectiveness, and this in turn influences the mutual understanding of the current and future role of IT in the company and how the CEO supports current and future IT initiatives (Hütter et al., 2016, p. 1523).

Preston and Karahanna investigated IT strategic alignment between the CIO and the TMT and found that shared language, shared domain knowledge, and a shared structural system of knowledge have a positive effect on shared understanding. This shared understanding in turn had a positive effect on the IT strategic alignment (Preston and Karahanna, 2009, p. 159).

CEO/CIO strategic alignment was investigated by Johnson and Lederer (Johnson and Lederer, 2010, p. 146) who examined the question of whether mutual understanding between the CEO and CIO leads to strategic IT alignment and if this in turn leads to a better IT contribution to the organization. Their main finding was that IT strategic alignment led to a greater IT contribution to the organization and they also stated that CIOs should devote more effort to improving the way IT supports the overall company success by supporting business process efficiency (reduction in labor and materials), which in turn can offset the costs created by IT.

Whitler et al. examined the triadic principal-agent relationship between the CEO, CIO, and CMO who normally is also a part of the TMT (Whitler et al., 2017, p. 314). The research stresses the need for the CEO to manage the CMO–CIO conflict regarding goals and accountability. CEOs are asked to establish management mechanisms to foster CMO–CIO alignment, whereby the authors also suggest mechanisms that the CMO and CIO can put into place if the CEO does not succeed in establishing alignment mechanisms (Whitler et al., 2017, p. 320, Figure 1). Among these mechanisms that promote alignment are measures of perspective alignment, accountability alignment , goal alignment and structural alignment.

In the attempt to mirror the findings of the CEO/CIO literature to a broader and more generalized view it was found that such research does not exist in the same extent for CEO and other top managers. Yet, some literature can be found on the relationship between CEO and chairman of the board. Several studies (Benlian and Haffke, 2016, pp. 104–126; Hütter et al., 2016; Johnson and Lederer, 2006, 2009, 2010; Preston, 2003; Preston and Karahanna, 2009; Stolk et al., 2016, pp. 180–191; Whitler et al., 2017) highlight the importance of mutual understanding between CIOs and CEOs for IT's financial contribution to organizations. Factors like shared mental models, communication, and hierarchical positions play a role. However, there's limited research on the relationships between CEOs and other top managers.

Business IT alignment

The need of aligning the offering of IT departments with the rest of the business have been discussed in research as early as the late 1970s. The reason for this is that as companies grow and get more complex the need to support the evolving business strategies by IT supported business processes get more important. Therefore it can be stated that the business IT alignment process is the most important strategy process of an IT organization, this is also widely discussed in literature. Luftman et al. (Luftman and Brier, 1999, p. 109) first investigated six important enablers and inhibitors to the success of IT in organizations and ranked them according to their impotence shown in Table 2-3:

Table 2-3: Ranked enablers and inhibitors to IT success in companies

Enablers	Inhibitors
Senior executive support for IT	IT/business lack close relationships
IT involved in strategy development	IT does not prioritize well
IT understands the business	IT fails to meet its commitments
Business/IT Partnership	IT does not understand business
Well-prioritized IT projects	Senior executives do not support IT
IT demonstrates leadership	IT management lacks leadership

Source: Luftman and Brier. (Luftman and Brier, 1999, p. 109)

The result shows that both on the enabler and the inhibitor side the ability to understand the business is mentioned. Additionally, the enabler side shows that IT should be involved in the strategy development. Therefore, Luftman and Brier (Luftman and Brier, 1999, p. 118) put forward the proposal that both IT and business executives emphasize the necessity for IT to comprehend the company's business context, which includes aspects such as understanding the customer and competitor landscape. Key elements of this proposition include IT gaining an understanding of the business, the business gaining an understanding of IT, IT using business language for communication, and IT concentrating on applying technical knowledge to identify business opportunities.

Reinheimer and Robra-Bissantz (Reinheimer and Robra-Bissantz, 2014, p. 529) see that IT and business need to align in six fields: strategy, processes, infrastructure, platforms, applications, and services. If BITA does not work sufficiently gaps occur, which in turn result in missing or bad IT effectivity regarding the support of business processes. Therefore they suggest on an operational level of BITA a gap model in order to identify and close implementation gaps, specification gaps, information system design gaps, organization and cultural gaps, and lastly innovation gaps (Reinheimer and Robra-Bissantz, 2014, p. 532).

Other researchers rather focus on the strategic perspective of BITA as this supports Luftmans proposal that IT understands the business and business understands IT. Therefore they focus solely on the question if IT is aligning its strategy with the company strategy and how intense

the CIO's involvement in the development of the company strategy is (Nissen and Termer, 2014, p. 90). Amarilli,et al. (Amarilli et al., 2023, p. 3) view the business-IT-alignment as a coevolution process consisting on the one side of a IT department external activity of designing the digital business strategy based on the business and IT needs of the organization. On the other side of a IT department internal activity of adapting the technical sub-system and the social sub-system. Due to the involvement of multiple sub-systems within the organization the business-IT-alignment process is shaped by numerous feedback-loops in order to align business requirements and IT offering.

Henderson and Venkatraman came up with a model on how to align IT with business (Venkatraman et al., 1993, pp. 139–149). Also Chan et al. (Chen et al., 2010, p. 233) suggest a diagnostic tool for organizations to assess IT strategies in order to improve business IT alignment.

The alignment of IT with the broader business goals has been a long-standing concern and is racknowledged as a crucial strategic process within IT organizations. Researchers have identified key enablers and inhibitors for IT success, emphasizing the need for IT professionals to understand the business and actively participate in the development of business strategies.

Reinheimer and Robra-Bissantz (Reinheimer and Robra-Bissantz, 2014, p. 529) highlighted six areas in which IT and business need to align to prevent gaps that can impede IT effectiveness. To address these gaps, they proposed an operational gap model. Other researchers have taken a strategic approach, focusing on the alignment of IT strategy with company strategy and the involvement of the CIO in shaping the overall strategy.

Amarilli and colleagues (Amarilli et al., 2023, p. 3) introduced the concept of a coevolution process for business-IT-alignment, recognizing the dynamic nature of aligning IT with business needs. This process involves both external and internal activities and is characterized by multiple feedback loops to ensure that business requirements and IT offerings remain in sync.

In conclusion, Business-IT Alignment is a multifaceted and dynamic process that requires continuous attention and adaptation to support the ever-changing needs of modern organizations. Researchers and practitioners from the science field of business informatics continue to explore and refine strategies to achieve effective alignment between IT and business functions.

Principal's knowledge about agent's work

A special facete of BITA is the need for knowledge in the top management in order to understand the value and field of application of IT.

Termer (Termer and Nissen, 2013, p. 557) concludes from their research that the higher the IT knowledge of the top management, the higher the probability that the CIO as IT decision maker is part of the company strategy development.

These findings are also in line with the research of Guillemette and Paré (Guillemette, M. G. and Paré, G., 2012, p. 187) which conclude that it influences the CEO's view of the potential value of IT tools and the level of IT knowledge of the rest of the top management team.

In a different study, Guillemette and Paré (Guillemette and Paré, 2012, p. 187) suggest that within the strategic context, top executives view IT as havinging significant strategic influence on the company's performance, and there is an expectation for IT planning to be closely coordinated with corporate planning.

Boynton et al. showed in their research that high levels of managerial IT knowledge will directly and positively influence the use of IT in an organization (Boynton et al., 1994, pp. 300–302).

Peppard (Peppard, 2010, p. 77) quotes a director of a global investment bank

> I think another enabler [of a CIO's ability to deliver against expectations]is the level of IT literacy of the rest of the management team. The more the management team understands IT, the more likely it is that the CIO will be able to negotiate expectations in an informed and rational manner, and deliver them.

A series of research findings emphasize the importance of IT knowledge within top executive ranks. Termer and Nissen's (Termer and Nissen, 2013, p. 557) research suggests that greater IT expertise among top management increases the likelihood of the CIO's involvement in shaping the company's strategic direction. Similarly, research by Guillemette and Paré (Guillemette, M. G. and Paré, G., 2012, p. 187) shows an interconnection between the CEO's perception of IT's value and the IT knowledge of the entire top management team, particularly in strategic contexts where IT is seen as having a substantial strategic impact, necessitating alignment between IT and corporate planning. Boynton et al.'s (Boynton et al., 1994, pp. 300–302) study supports the idea that a higher level of IT knowledge among managers directly and positively affects IT usage within an organization. Additionally, Peppard (Peppard, 2010, p. 77) highlights the role of IT literacy in enabling CIOs to effectively manage expectations and deliver results.

In conclusion it can be stated that IT knowledge plays a crucial role in an organization's top management team. A deeper understanding of IT among top executives directly correlates with the CIO's involvement in strategic decision-making and the overall success of IT initiatives. These findings underscore the importance of promoting IT literacy at the highest levels of leadership within an organization

2.4. Influential factors from company processes

Katou (Katou, 2015, pp. 329–353) describes the impact of leadership as a series of interconnected relationships involving organizational justice, organizational trust, and employee reactions, which contribute all to organizational performance. Leaders play a dual role in fostering organizational trust. Firstly, they directly contribute to it by serving as role models who uphold integrity expectations. However, it's important to acknowledge that executives cannot be omnipresent. Therefore, an effective approach to operationalizing their integrity is through the design of procedures and processes that align with the best interests of the company and its management. Only when both organizational justice and genuine leadership align can organizational trust reach its maximum effectiveness. This, in turn, leads to positive employee reactions, such as increased work motivation and job satisfaction, which subsequently drive organizational performance.

(Coldwell and Perumal, 2007, p 197, p 214) suggest, drawing from Adams' Equity theory (published in 1965), that employees' work-related attitudes are influenced by their perception of how they perceive the ratio of inputs to outcomes. They also found that inaquity have effects on work motivation and job satisfaction. When employees believe there is an imbalance, they often seek to rectify it by adjusting their input relative to their output until they feel they are fairly rewarded for their contributions. Cohen-Charash and Spector (Cohen-Charash and Spector, 2001, p. 281) describe that, when employees perceive interactional injustice, they tend to react negatively toward the person responsible for the perceived unfairness. Furthermore, if procedural injustice is prevailing in an organization, employees may harbor resentment towards the organization and its leadership. This could potentially lead to the emergence of moral hazards, characterized by hidden actions that do not align with the employer's best interests. One key factor that mediates this process is trust, which will be explored in greater detail in a subsequent section.

This research looks into the impact of HR related company processes specifically the performance management system, which is the precondition for a fair and effective monetary incentive structure.

In summary, this section highlights the influence of leadership, organizational justice, and trust on organizational performance and employee reactions. It highlights the importance of aligning factors for optimal outcomes. Additionally, it discusses how perceptions of fairness and injustice in compensation and interactions affect employee attitudes and behaviors. Lastly, it touches on the role and mediating effect of trust within the principal agent relationship.

Performance management systems

Performance management systems are a form of management control systems and this area has been widely researched before by different scholars. (Chenhall, 2003, pp. 127–168; Grabner and Moers, 2013, pp. 407–419)

In most cases the performance management systems are described in form of processes with different activities to be performed. Exemplarily a more general performance management process described by Park (Park, 2010, p. 411) is compared with a IT specific process described by La Paz (La Paz et al., 2018, p. 7) in Table 2-4.

Similarities of the two approaches are that both processes involve a structured approach to managing and measuring performance within an organizational context. Furthermore processes emphasize the importance of defining performance criteria and standards. Most importantly both approaches show the importance of feedback and corrective actions to improve performance. Yet, key differences can be observed in the area of scope: Park's (Park, 2010, p. 411) process is more general and applicable to various organizational contexts, while La Paz's (La Paz et al., 2018, p. 7) process is tailored specifically for IT organizations, with a focus on aligning IT performance with business objectives. Tailored to the needs of IT and aligned with the idea of business IT alignment through IT specific elements which touch the topic of alignment, communication and measurement.

Table 2-4: Comparison of exemplary performance management processes in general management and IT management from the literature

Park (General Process)	La Paz (IT specific process)
1. Establishing performance standards 2. Communicating standards and expectations 3. Measuring performance 4. Comparing with standards 5. Evaluating results 6. Providing feedback 7. Taking corrective actions	1. Strategic definition (business scope and business objectives) 2. IT scope definition (IT role and CIO responsibility) 3. Negotiation 4. Performance definition 5. Measurement definition (performance measures and result measures)

Source: Authors own construction based on Park (Park, 2010, p. 411) and La Paz et al. (La Paz et al., 2018, p. 7)

They are necessary due to the role of IT departments as internal service providers on one side and governance bodies on the other side.

- Strategic elements: La Paz's process includes strategic elements related to business scope, IT role, and CIO responsibility, which are not explicitly mentioned in Park's general process.
- Negotiation: The process of La Paz includes a negotiation step which is needed for alignment and agreement between IT and business stakeholders. It is not part of Parks universal performance management process.

- Measurement focus: La Paz's process focuses on performance measurement which includes both performance measures and result measures. This is more technical and IT-related compared to Park's process.

In summary Park's (Park, 2010, p. 411) general performance management is a framework which can be applied universally across different organizations. It consists of generic steps such as setting expectations, measurement, evaluation, feedback, and corrective actions. La Paz's (La Paz et al., 2018, pp. 6–9) IT-specific process is in contrast specifically tailored to the use in IT organizations. It sets a greater emphasis on aligning IT performance with business objectives. The IT-specific process also relies on measurement in a more technical context.

When addressing the challenges related to performance measurement, various approaches are available. For instance, Lebas' (Lebas, 1995, p. 29) perspective on performance is that the efficient utilization and supervision of process is important. This approach is designed to facilitate the achievement of predefined goals, taking into account constraints and circumstances.

Research underscores managerial difficulties faced by public organizations when it comes to creating and sustaining evaluation systems. The factors that contribute to the ineffectiveness of managerial assessment systems include political influences during the appraisal process, the absence of objective performance measurement data, the presence of biases and errors, supervisors inadequately trained to evaluate their subordinates, unclear performance criteria, ineffective rating tools, and a misalignment between performance evaluations and reward systems (Kellough and Lu Haoran, 1993, pp. 45–64; Longenecker, 1997, pp. 212–218).

In response to these critiques, various frameworks for assessing performance have been devised with the aim of promoting a more well-rounded approach. To illustrate, Keegan et al. (Keegan, 1989, p. 422) emphasize the importance of striking a balance between internal and external metrics, as well as financial and non-financial indicators. Cross and Lynch (Cross and Lynch, 1988-1989, p. 25), with their SMART Performance Measurement System, articulate a four-level pyramid of objectives (top down) and measures (bottom up) linking strategy and operation. of measures that are interconnected and span the entire organizational hierarchy. Fitzgerald et al. (Brignall et al., 1991, p. 36) distinguish between results and their underlying factors, while Kaplan and Norton (Kaplan and Norton, 2001, pp. 87–104) introduce the concept of the "balanced scorecard" as a tool for strategic management rather than a pure performance management tool. comprising four distinct perspectives. These frameworks are multidimensional and prioritize non-financial information, striving to restore equilibrium by including external indicators of success, early signs of future business performance, and records of past accomplishments (Bourne et al., 2000, p. 757).

The process of measuring performance presents two challenging dilemmas that demand effective resolution. Firstly, there is the necessity to establish a clear definition of performance. Secondly, the identification of appropriate metrics holds paramount importance (Lebas, 1995, p. 26). A meticulously crafted definition for both performance and metrics is anticipated to exert a significant influence on behavior and align resource allocation with the attainment of goals and objectives. On the other hand, if a definition isn't clear or is incorrect, it can cause problems by steering efforts away from their original goals. This is why the definition of measurement ends should be developed in a discursive process achieving consensus of all involved stakeholders (Broadbent and Laughlin, 2009, p. 288). Management acknowledge that performance management systems are sometimes too complex ant that they are constantly reviewed and changed (Johnston et al., 2002, pp. 258–259).

A survey conducted among senior managers in the forestry and wood working sector in Slovakia revealed valuable insights. The three most important factors to these managers are an appropriate base salary, job security, and a fair appraisal system. Following closely are the supervisor's approach and supervisor's recognition, ranked 6th and 7th, respectively (Lorincová et al., 2016, p. 10344). This demonstrates a clear correlation between how supervisors are perceived and the effectiveness of the performance management system. It can be interpreted that when employees accept the organizational framework and processes related to performance management systems, the role of the supervisor becomes vital as a corrective and controlling entity.

Most researchers have similar views on effective management and balanced measurement as well as that role definitions need to be aligned. This includes the importance of timely attainment of objectives within the constraints of an organization, the consideration of aspects beyond financial metrics. Finally that that the definition for performance and measures can influence behavior and resource allocation in alignment with organizational goals.

The main differences are:

1. Lebas' (Lebas, 1995, p. 29) causal model**:** Lebas' definition of performance is rooted in the effective deployment and management of components within a causal model. This implies a focus on understanding the cause-and-effect relationships within an organization to achieve performance goals. Other authors do not explicitly focus on causal models.
2. Response to criticisms**:** Some performance measurement frameworks were developed in response to criticisms and challenges in public organizations, such as political influences, biases, and misalignment. Lebas' definition does not explicitly address these challenges but instead provides a conceptual framework for understanding performance.

3. Specific frameworks**:** Some authors suggest more specific frameworks like balanced scorecard or a pyramid of measures. In contrary the definition of Lebas is more abstract and conceptual and it providing a theoretical foundation rather than a specific framework.

In summary, both the definition of Lebas performance and the various other authors measurement suggestions focus on the effective deployment and management of performance component as well as the importance of a balanced measurement. The correct definition of performance and measures is seen as important. However, the approach of Lebas is based on the concept of causal models and does not directly address the practical challenges faced by organizations. Frameworks on the other side try to takle this issue. Some authors provide specific tools and approaches for organizations to implement a balanced performance measurement in response the challenges arising from the VUCA world. Among them political or social influences and misalignment between appraisal and reward systems. The importance of supervisor perception in the effectiveness of performance management is mentioned by scholars They hold a role as a corrective and controlling entity after employees have accept the organizational framework and the processes related to a performance management systems.

Performance management systems and the use of them as well as the existence and use of key performance indicators (KPI) are the basis for any evaluation of performance of employee and and organization performance. All of them are the foundation for a fair and well operated incentive management system.

Incentive management systems

In the area of employee needs, it is widely acknowledged that monetary compensation is just one piece of the puzzle. Hilmarsson and Rikhardsson (Hilmarsson and Rikhardsson, 2011) draw attention to various aspects such as engaging projects, peer and superior recognition, and personal development—both as individuals and within their job roles. They also emphasize that improperly structured incentive payment systems can have detrimental effects. Furthermore, they argue that incentive systems have evolved beyond merely boosting productivity; they now serve as strategic tools for implementing strategies, aligning goals, and mitigating moral hazards.

In today's corporate landscape, incentive management systems have become the go-to method for rewarding and recognizing employees, particularly in larger organizations where fairness in acknowledging employee contributions is a priority.

Numerous researchers have investigated the topic of monetary incentives. For instance, Dikolli et al. (Dikolli et al., 2009, pp. 142–143) explored the relationships between performance metrics, effort, and the optimal levels of incentives. The effectiveness of incentive payments in

the context of management control elements were examined by Friis et al. (Friis et al., 2015, p. 241). Holstrom and Milgrom (Holstrom and Milgrom, 1991, pp. 50–51) suggested that employee salaries should include both fixed and variable incentive components. This is especially true, when job tasks involve various methods of measuring effort and results.

The goal-setting theory suggests that striving for high, well-defined, self-accepted goals leads to enhanced performance of individuals. This results in increased financial rewards, heightened affective motivation, and greater intrinsic job satisfaction (Locke and Latham, 1990a, 1990b, pp. 240–264; Tosi et al., 1991, pp. 480–483).

In this context, offering attractive monetary incentive systems, such as pay-for-performance plans integrated into organizational and task designs, is expected to cultivate positive job attitudes within public organizations (Rainey and Steinbauer, 1999, p. 17).

Vroom (Vroom, 1964, pp. 252–260) underscored that a combination of salary increases and other compensation rewards encourages employees to anticipate that improved performance will ultimately be rewarded. Kohn (Kohn, 1993, no pagiation) succinctly put it, "Pay people well and fairly, then do403 everything possible to help them forget about money." Akintola and Chikoko (Akintola and Chikoko, 2016, p. 8) emphasize the essential role of incentives, both monetary and non-monetary, in management positions, highlighting their contribution to maintaining a positive work environment. Principal-agent theory, as examined by Park (Park, 2010, p. 403) and previous literature (Conlon and Parks, 1990, p. 603; Eisenhardt, 1988, pp. 488–511, 1989, pp. 57–74), extensively explores the theoretical effectiveness and practical applications of incentive and control systems in organizations. Sypniewska (Sypniewska, 2014, p. 67) found that workplace atmosphere has the most significant impact on job satisfaction, whereas a company's culture has the least influence. Factors related to interpersonal relationships and the economic aspects of work exert the most substantial influence on overall job satisfaction. Pandey and Asthana (Pandey and Asthana, 2017) discovered that compensation packages contribute to over half of employee job satisfaction, underscoring their critical role in employee well-being. Companies like Ritz-Carlton (The RITZ-CARLTON leadership center, 2019) promote an empowerment program where employees can decide how to resolve issues with a dedicated budget for each guest's problem. Siemens introduced a second career path in 2006 alongside the management track. Employees in the innovation sector can be promoted to the "Key Expert" path, gaining more visibility and the ability to work in global committees, with a salary comparable to managers but without management responsibilities (Schanz, 2010; Siemens Healthineers, n. y.).

Managers often overestimate the importance of monetary rewards to employees. Organizations use money as a rewards as this is very convenient and easy to accomplish, but research shows

this practice may not allwas align with the true motivations of employees (Hilmarsson and Rikhardsson, 2011, p. 11).

Belfo (Belfo, 2013) suggests in the context of IT alignment research, that a well established and fair incentive system is crucial to enhance the business-IT alignment process within organizations. This perspective aligns with the principal-agent theory, which focuses on the reduction of information asymmetry and the implementation of measures to reduce moral hazards.

The used literature on incentive management systems presents in summary different viewpoints on the role of incentives in motivating employees and enhancing organizational performance. The similarities and differences on these viewpoints are:

In the domain of employee compensation, the literature underscores several key points.

- Firstly, employees have needs extending beyond monetary rewards, including engagement in meaningful projects, recognition, and personal development.
- Secondly, improperly structured incentive systems can have harmful consequences and this might result in the fact that employees are not effectively motivated.
- Thirdly, incentives systems have evolved into strategic tools for goal alignment and strategy implementation.
- Finally, compensation structures which combe both fixed salaries and variable incentives, is crucial. This is especially true when employee tasks involve varying ways to measure effort and results.

The differences in literature discuss the role of monetary incentives in employee motivation and job satisfaction. Some, like Dikolli et al. (Dikolli et al., 2009, p. 142) and Vroom (Vroom, 1964, pp. 256–258), emphasize the significance of monetary rewards. Others authors, including Hilmarsson, Rikhardsson (Hilmarsson and Rikhardsson, 2011, p. 11) argue that the true motivations of employees might not be satisfied by monetary rewards. Sypniewska (Sypniewska, 2014, p. 67) emphasizes the impact of workplace atmosphere on job satisfaction which is different from studies that prefer compensation packages. Managers tend to overestimate the importance of money to employees. This is why Hilmarsson and Rikhardsson (Hilmarsson and Rikhardsson, 2011, p. 11) suggest a need for a more balanced approach to motivation and engagement.

The differences found in the literature regarding incentive management systems reflects the complexity of human motivation and the diversity of organizational contexts.

1. The Role of Monetary Incentives: The varying perspectives on the role of monetary incentives asks for a nuanced approach. While monetary rewards can be effective, they

should be complemented with non-monetary incentives and a recognition of individual differences in what motivates employees.

2. Workplace Atmosphere vs. Compensation: Researchers presented different views regarding workplace atmosphere and compensation packages. Therefor organizations should consider a wider approach to drive satisfaction of their employees. Even if positive workplace environment can enhance the job satisfaction of employees, companies and managers need to paid attention that a fair compensation is offered to the employees.
3. Managerial Perception: The disconnect between managers' perceptions of employee motivations and employees' actual preferences underscores the importance of understanding the workforce's needs and aligning incentives accordingly. Effective communication and feedback mechanisms are vital for achieving this alignment.

In conclusion, the literature on incentive management systems underscores the need for organizations to adopt flexible and multifaceted approaches to motivation and reward systems. While monetary incentives play a role, they should be part of a broader strategy that considers the diverse needs and motivations of employees in different organizational contexts. Social needs and hygiene factors as influencing factors.

2.5. Qualitative research providing insights into work attitude factors of top managers in general

By adding a different perspective to findings of the literature analysis in form of interviews of experts the results will be triangulated with an additional research method in the study of the same phenomenon (Denzin, 1975, p. 297). He postulated that the validity and reliability of research is greater than when using only one methodological approach. In specific this research will use the method of methodological triangulation according to figure 2-3.

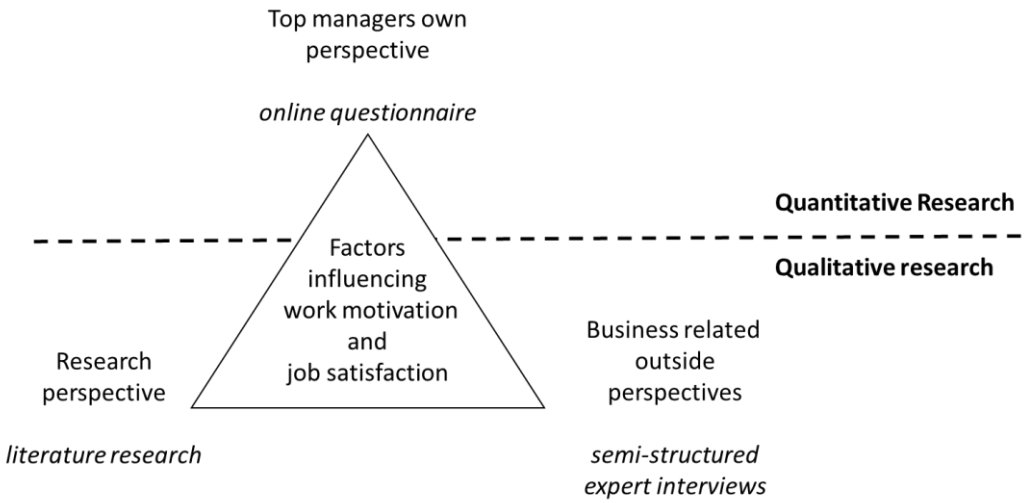


Figure 2-3: Combination of research methodologies to compare managers perspective with expert perspective

Source: author's own construction

This involves both quantitative and qualitative methods of data collection (Easterby-Smith et al., 2000). The benefit for the contribution to management science by using the quantitative method of an survey is that it can be used for theory generation and also for its verification. The same is true for the qualitative research method of an interview which can also be used for theory verification and generation (Punch, 2011).So both quantitative and qualitative methods will support in gaining a greater insight.

The following chapter describes the process and execution of in-depth expert interviews.

In-depth expert interviews

To provide more insight into the topic of factors influencing work attitudes of Top Managers the quantitative method of an in-depth interview is selected. These in-depth interviews are intensive individual interviews with a small number of participants to explore their perspective on a particular field of interest (Boyce and Neale, 2006, p. 3)The participants of these in-depth interviews are in the case of this research experts which have extensive expertise in a certain field either in science (Gläser and Laudel, 2010) or in practice or are a representative of an association representing either the employers side or the employee side or the supplier side of management consulting or management coaching.

The issue with in-depth interviews or expert interviewees is that generalizations about the result cannot be drawn due to the small participant number and selection method of the interviewees. However the result of the exploratory method of interview can supplement other methods of data collection. To overcome this problem the author has chosen to find experts from different areas dealing with the top management of companies.

For this research semi structured interviews with open questions are used (Atteslander et al., 2023)to validate the data from the quantitative research with a survey. The scope of the interview guide with 4 main questions and 5 detailing questions and an closing question is within the range of 8 to 15 questions recommended by Gläser and Laudel (Gläser and Laudel, 2010)for a semi-structured interview.

Definition and selection of interview candidates and procedure

In-depth interviews can be done as semi structured with the use of open questions (Döring and Bortz, 2016, p. 359). A predefined interview guideline with three different question complexes are used to guide the interviewee and thereby the interviewer can control topics and the procedure. On the other hand it enables the interviewee to speak freely and think loudly (Döring and Bortz, 2016, p. 371). This helps him to describe the issues and come up with suggestions and solutions. This gives the interviewer the unique possibility to explore new insights outside of his field of competence. The interviewer might also use circular questions in order to gain insight from other perspectives than the ones of the expert.

Within this research this means that experts should have:

- own experience on either being a subordinate manager or a supervising manager. Yet, the interviewee needs to be able to segregate his own experience from generalized insights gained by his or her task as an expert.
- gained knowledge from research, from work as a consultant or top management coach with a variety of clients on a top management level or from work for an association dealing with topics of leadership and management.

The criteria is checked prior to the first contact and the subsequent invitation of the interviewee and is later validated in the introductory questions before the in-depth interview starts.

To gain a 360° view on the topic it was decided to choose five different perspectives investigating the topic of factors influencing work-related attitudes of top managers as depicted in figure 2-4.

In the course of the search for matching candidates for the expert interviews it was decided to look for experienced persons which have one or several perspectives on the topic. As own experience as a principal or an agent on a top management level and one or more of the following experiences.

- Being a researcher/lecturer in Management Science or Human Resources.
- Being a representative of the employees associations or the employer / owner associations
- Being a supplier with frequent and close contact to the top management of the company on either management consulting or management coaching.

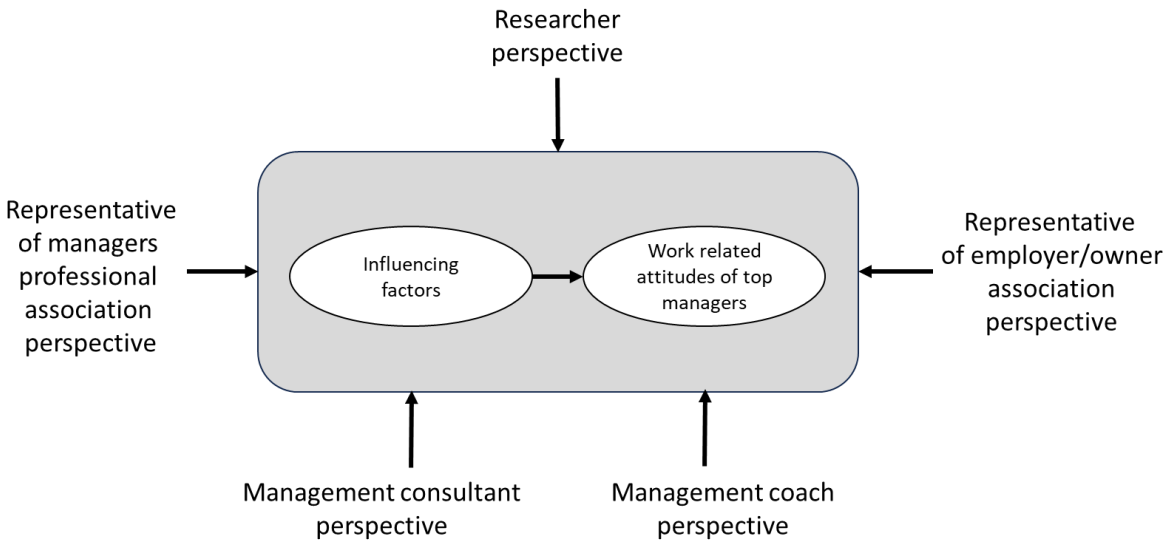


Figure 2-4: Interviews enable 360° view on Factors influencing work-related attitudes of top managers.
Source: author's own construction (Roscher and Balina, 2023, p. 34)

This led after receiving the acceptance from the invited persons to a list of seven experts shown in table 2-5.

The interviewees are briefed in advance about the topic, the process and outline of the interview. The interview starts with opening questions asking for biographic background of the participant and some administrative questions like the willingness to disclose personal or institutional information. After this the interviewee is asked four main questions in the cause of the interview, supplemented with pre-prepared detailing questions in case the conversation falters. Due to the fact that one interviewee strictly wanted to maintain anonymous, the principal of anonymity was applied to all participants. All participants have own leadership experience of at least 15 years and all had leadership spans between 5 and 20 direct reports.

The types of direct reports varied due to the background and role of the participants from consultants, software developers, military personal, academics, office staff, therapists, coaches to managers with different background.

Table 2-5: List of experts interviewed

No.	Gender	Profession*	Professional association membership	Highest academic degree	Contributing to perspective	Management experience	Maximal leadership span
1	M	Owner of consultancy firm		Doctor	Management consulting	15	7-8
2	M	Supervisory board member (for multiple firms)	Chamber of commerce	Doctor	Employer/owner association	30	20
3	F	Manager	Workers association	Doctor	Workers association	16	12-15
4	M	Psychologist & owner of a business coaching school	Coaching association	Doctor	Management coach	30	5-6
5	M	Managing director, management consultant		Doctor	Management consulting	22	15
6	M	Professor, chair holder in strategic management	Association of strategic management	Doctor	Researcher	20	12
7	M	Owner of IT consulting company	Owners association, IT association, chamber of commerce, former editor of scientific journal	Doctor	Owner association	25	17

*Two of the interviewees are additionally part time professors at universities for applied sciences and one is visiting lecturer at an university.
Source: author's own construction

Expert perspectives on factors affecting work-related attitudes of top managers

The experts were asked six questions covering the used variables in this thesis.

- Question one covered the work-related attitudes of top management.
- Question two covered the procedural factors influencing work-related attitudes.
- Question three covered the interpersonal factors influencing work-related attitudes.
- Question four covered the topic of the importance of information between the Principal and the Agent.
- Question five covered the importance of trust in the relationship between the executive and top management.
- Question six covered the question how important it is that the principal has a fundamental understanding of the top manager's area of activity and work content.

As the participants were questioned regarding the general viewpoint of interaction between executive manager and the top managers reporting into them a clarifying question was added in order to get an answer on the question if an top-IT-manger is different compared to other top managers like head of production, head of development and others. The interview guideline for

the expert interviews is documented in Appendix C. The results of the study (Roscher and Balina, 2023) give deeper insight into the viewpoints of the interviewees.

Work Attitudes:

Based on the provided responses from the interview participants regarding the question of the most important work attitudes for top managers, the following conclusions can be drawn:

Commonalities include a focus on goal orientation, emphasizing the need for clear objectives, and a willingness to adapt to new strategies. Authenticity and credibility of a principal are seen as extremely important. This can be achieved by leading by example and treating employees with respect. The success of the entire organization builds on motivation of its employees.

Other attitudes like enthusiasm, leadership qualities, foresight and vision, and experience provide insights for decision-making.

Differences between employer and employee representatives show that goal orientation is important. However, the employee representative also finds leadership qualities to foster effective people management crucial.

A ranking based on interviews is order by importance: goal orientation, motivation, willingness to change, authenticity, enthusiasm, leadership qualities, foresight and vision, and experience. Due to the limited number of interviewees it needs to be taken into account that the result is preliminary and needs more validation in future research. Overall it can be stated that there is an agreement of the importance of the identified attitudes for top managers regarding the impact on organizational success.

Procedural factors:

The interviewees answers regarding the question which procedural factors within an organization will influence the work motivation and job satisfaction will discussed by summarizing and comparing the viewpoints of the interviewees. A detailed analysis of the interviews is documented in Appendix D.

Interviews reveal commonalities in emphasizing efficient communication, clear decision-making, positive organizational culture, supportive leadership, and transparent performance evaluation processes as motivators for top managers. Trust is enhanced by different factors like procedural clarity provided by the organization, task allocation and transparent responsibilities managed by the manager.

Interviewees revealed different opinions on incentive approaches, leadership styles, goal-setting emphasis, feedback importance, and decision accountability. Yet, there was an agreement that the alignment of individual goals and incentives to defined organizational objectives and the company culture is of upmost importance.

Owners prioritize hierarchical goal-setting, while the representative from the employee side stressed procedural factors, culture and technology in order to support the setup and execution of performance management and incentive management processes. The reason for this might be that there is the believe that technology and aligned procedures are unique and fair. The employee side sees trust and long-term goal alignment as very important.

The expert interviews show that the alignment of procedural factors with organizational goals and the company culture is very important. The analysis of the interviews gives organizations, that want to enhance work attitudes of their employees several thought impulses. Both the owner and workers associations perspectives revealed differences in goal-setting approaches but also showed the importance of trust and long-term alignment of incentives.

Interpersonal factors:

Key points from the responses of the seven interviewees regarding the interpersonal factors that most influence the work attitudes of top managers. A detailed analysis of the interviews is documented in Appendix E.

Common themes from interviews stress leadership compatibility, open and transparent communication, empathy, recognition, trust, and psychological safety. Yet also individual opinions can be noted, for example the management consultant emphasizes that aligning values is important. The board member mentions that empathy as a very high impact, and the workers association member highlights the importance of team dynamics. In contrast the management coach highlights enjoying collegial relationships and psychological safety, while another consultant sees recognition and challenging tasks as motivating. The strategic management researcher emphasizes relationships at the same hierarchical level, family support, and trust-building, while the owner perspective stresses objectivity, diverse opinions, and adaptability.

In conclusion, common themes include leadership and communication elements, but nuanced differences arise based on experiences, perspectives, and cultural factors. Addressing these interpersonal factors is important for crating and maintaining positive work attitudes of top managers and their teams.

Information related factors:

The seven interviewees were questioned regarding the significance of information in the relationship between management and top managers. A summary of the answers of the different interview participants a quite differentiated view on the topic which can partly be explained by their background and education.

The interviewee from with the management consulting background emphasizes the importance of not just disseminating information but also of top managers and management working

together on strategies and goals. Criticism is expressed when information is merely passed down hierarchically without facilitating genuine dialogue and discourse.

The interviewee from the owners association view underscores how crucial it is to make information comprehensible and accessible, especially when it concerns financial data. External consultants and coaching are mentioned as valuable resources. Also cultural differences in different companies are mentioned.

The participant from the workers association stresses that information should flow in both directions, from management to top managers and vice versa. The actuality of information is considered crucial for successful collaboration between manager and subordinate. External sources of information are also mentioned among them customer conversations and conversations within the network of the managers.

The interviewee with the business coaching background highlights that the problem often lies in inadequate information distribution which leads to uncertainty. Information provides a sense of security and creates a desire for more information. The topic of risk in decision-making is also addressed.

Another participant of the interview from a management consulting background noted that information is seen as essential to support decisions and to reflect on gut decisions. Both structured and unstructured information are considered relevant. The need for communication and coordination is emphasized by the participants of the interviews.

The interviewed researcher discusses the role of top managers in collecting and distributing information. He emphasized that leaders view information subjectively and act as an interface for provision and distribution of information. Additionally he stats that different types of information are required for different position and responsibilities.

The interviewee from a owners association considers trust to be extremely important in the workplace. He highlights the need for employees to trust that their jobs are secure based on the belief that management takes the right decisions. Leaders should serve as a mentor, and trust is an important part of a mentorship role. It's not about looking up to a leader, but rather having confidence in their abilities. Trust is seen as essential, without trust, the workplace can become transactional and lacking in a sense of shared purpose between leader and employee.

Overall, based on the answers of the interview participants that information plays a central role in the relationship between management and top managers. Information should not only be passed down hierarchically but there should be dialogue and an active collaboration in developing strategies and goals. The actuality and clarity of information provided to employees are considered crucial. Finally the ability to interpret information is also highlighted.

When specifically comparing the interview from the owners association view and the interview from the workers association role, based on their responses regarding the importance of information in the context of management and decision-making:

The two Interviewees representing the owners association:

- Emphasize structured information, especially financial data, for effective decision-making.
- Highlights the importance of making information understandable and accessible.
- Mentions the use of external consultants and coaching as helpful resources.
- Suggests that communication and simplification of complex information are essential.
- Touches on the role of culture in information exchange within organizations.
- Focuses primarily on the interpersonal aspect of trust between employees and leadership. It brings a more human-centric perspective to the discussion.
- Underscores the critical importance of trust in both directions, from employees to leadership and vice versa. It aligns with the overall theme of effective communication and collaboration seen throughout the interviews, albeit with a stronger emphasis on the human aspect of trust.

The interviewee from the workers association:

- Stresses the importance of the timeliness of information in successful collaboration.
- Notes that managers gather information from various sources, including external ones like customer interactions.
- Highlights the challenge when information received by management doesn't adequately reflect the actual situation.
- Discusses the impact of the hierarchical organizational structure on information flow.
- Addresses the relationship between information and risk in decision-making.

The interviews show the importance of information regarding different perspectives within the organization.

Comparison:

- The participant from the owners association stresses that structured and understandable information is needed, particularly financial data. It also highlights the use of external resources like consultants.
- The interview partner from the workers association emphasized the timely and accurate flow of information. For the workers perspectives it is important to understand how hierarchical structures can affect the flow of information. The relationship between information and risk was also discussed.

The quality of and accessibility to information for management is a concern of one of the interviewees.

Regarding the impact of information within organizations one interview participant raised a concern that good decision-making and risk management can only be ensured if information flows and if information is timely. The seven interviewees were asked how important is a good trust relationship between a leader and an employee. The answers were closely examined to identify repeating topics and unique perspectives.

1. Trust as empowerment: The management consultant emphasized the importance of trust in empowering employees. He noted that when leaders trust their team members to work independently it creates a sense of ownership and commitment among employees.
2. Trust-based leadership: Another management consultant suggests management based on trust and delegation. He was of the believe that employees should be given autonomy. Resulting in a philosophy of trust-driven leadership.
3. Evolving leadership culture: The participant from the owners association pointed out that trust has become more significant in modern leadership. This includes coaching and listening, indicating a shift towards a more human-centric leadership style.
4. Trust during challenges: The participant from the workers association, pointed out that trust during challenging times, such as the COVID-19 pandemic is extremely helpful. She mentioned that in this difficult time many leaders passed the “trust test” by showing faith in their employees' capabilities.
5. Reliability and transparency: The person from a role of business coaching association stress that trust is necessary for reliability. He described trust as the assurance that both leaders and employees can rely on each other and that there are no hidden agendas. Transparency and clear expectations were key components of this trust.
6. Trust in risky situations: the researcher, mentions different facets of trust such as task trust and personality trust. He stressed that trust allows leaders to delegate and create space for innovation.

The analysis of these interviews reveals several themes around trust in the leader-employee relationship. Trust fosters empowerment, adaptability, and collaboration. It enables leaders to delegate effectively and it contributes to a healthier work environment.

In conclusion, trust is important in the relationship between leaders and employees. It empowers employees, facilitates effective leadership styles, and is helpful during challenging times. Trust forms a foundation of a good work atmosphere. Leaders who drive trust-building can expect greater employee engagement and organizational success.

<u>Knowledge related factors:</u>

The question how important it is for executive management to have a fundamental understanding of the activities and job content of top managers was also discussed in various interviews. The results are summarized in Appendix F. The participants stated all that it is important that the top management understands the work which is performed by subordinates. Decision-making, leadership evolution, and maintenance of a balance between micro and macro management are based on this understanding. Besides this also trust and delegation were mentioned as well as the need for a strategic sensitivity in regard to effective communication and alignment to organizational strategies.

Executives should understand their subordinates' roles, asking meaningful questions, and avoiding excessive detail. This will foster effective communication in the principal agent relationship and also increase strategic alignment and in turn performance.

The analysis of the interviews reveal a diverse range of perspectives on top management's understanding of subordinate roles and the management relationship. The interviewee from the owners association introduced that having no knowledge is unhelpful while excessive knowledge can be counterproductive. He highlighted that executives ask meaningful questions and have a basic understanding of their subordinates' roles. Yet, they should not go into excessive detail. The understanding required by managers normally varies depending on organizational culture and specific circumstances. For example, at BMW, there is a rule that only one level below should report up, reflecting the belief that overwhelming top management with detailed knowledge doesn't enhance decision-making processes.

Difference between IT managers and other mangers:

The question regarding the difference between a top IT manager and other top managers on the first level were answered in different detailing degree as not all the interview partners had experience with interacting with IT managers. In the following key points are identified and commonalities and differences analyzed:

Common Themes:

1. Strategic value and collaboration: All interviewees, emphasized the strategic importance of IT management. They all mentioned the need for collaboration with other functional areas to deliver real business value through IT initiatives.
2. Cross-functional knowledge: Several interviewees, highlighted that IT managers should have some understanding of the functions and processes of their colleagues. This knowledge helps to effectively communication and make decision-making.
3. Service orientation: The interviewees, stressed that IT managers, like other C-level executives, are internal service providers to the rest of the organization. Understanding

and fulfilling the needs of internal customers is of upmost importance. On the other side they need to drive standardization and cost-saving activities.

Differences:

1. Perceived complexity of IT: The interviewee which represents the Business and IT Consultant highlighted the potential challenges IT managers have in explaining the value and complexity of IT. Compared to top managers the IT manager's role is more demanding in terms of communication.
2. Personality traits for digital transformation: The researcher discussed the specific personality traits and skills required for roles related to digital transformation. These roles have to promote change within the organization and deal with resistance.

In summary, the interviews see the strategic role of IT management, with a special focus on collaboration, cross-functional knowledge, and service orientation. However, they addressed potential complexities of IT management in terms of explaining the value contribution of IT. These insights adds to the understanding of the unique characteristics and challenges of IT managers compared to other C-level roles.

Analysis discussion, and conclusions of semi structured expert interviews

The aim of this subchapters was to examine the perspective of experts from research and from professional associations regarding the most important work-related attitudes of top managers and the contribution of these attitudes to success of the organization. Additionally the experts were asked to identify interpersonal and procedural factors influencing the work-related attitudes of top managers. Finally the experts were asked about their insight and opinion regarding the importance of information in the relationship between a principal and an agent in the top management levels.

When summarizing the interviews the following aspects were identified:

1. The key work attitudes of top managers highlighted in the interviews include goal orientation, willingness to change, authenticity, credibility, and motivation. These attitudes are seen as contributing to organizational success.
2. There are no significant differences between employer representatives and employee representatives regarding these attitudes, suggesting their universal importance.
3. Interviewees from the owners association primarily focus on goal-setting and hierarchical approaches, while the worker association interviewee provides a broader perspective, considering factors like organizational culture, technology, trust, and long-term goal alignment.

4. The interviews commonly covered leadership compatibility, communication, empathy, recognition, trust, and psychological safety. However, it was clearly discuss that differences exist based on individual experiences and perspectives, and due to cultural and contextual factors.
5. Information plays a central role in the relationship between management and top managers. It was stressed that actual, timely, clear, and understandable data is needed in organizations. Also the habit of active collaboration in developmet process of strategies and goals.
6. Trust is identified as crucial in the principal agent relationship, it empowers employees and fosters a positive work atmosphere.
7. The understanding of top managers regarding the role of subordinate s is essential for effective communication, strategic decision-making, and goal alignment within the organization.
8. The interviews provided insights into the strategic role of IT management, collaboration, cross-functional knowledge, service orientation. It also discussed the challenges faced by IT managers in the context of digital transformation.

The expert interviews represent the third empirical method in this thesis. These expert interviews contribute to management science as well as to practical management and leadership. It adds insights in this field of research as follows:

1. Seven experienced German experts among them professors and a visiting lecturer, participated in in-depth interviews. All of the participants hold a doctoral degree. They offered an external and partly practical perspective on the principal-agent relationship due to their roles as consultants, coaches, association members, or researchers.
2. Universal Importance of Work Attitudes: Findings show no significant differences between employer and employee representatives in key work attitudes. This challenges the traditional notion of substantial variations between leaders and employees. In contrary, the value of attitudes like goal orientation, willingness to change, authenticity, credibility, and motivation are seen from both perspectives.
3. Balancing Hierarchical and Broader Perspectives: The interviews revealed a diffence between the views of the owners association and workers association perspectives. While the owners suggest a hierarchical approach to goal-setting, the workers asks for a broader view considering organizational culture, trust, and long-term goal alignment. This shows the need for a understanding of management beyond traditional hierarchical models.

4. Interpersonal Factors in Leadership: Common themes across the interviews were leadership compatibility, communication, empathy, recognition, trust, and psychological safety. Individual experiences and cultural/contextual factors provide a deeper understanding of how these factors operate in practice.
5. Information Flow and Collaboration: Information flow, dialogue, and active collaboration are important for developing strategies and goals. It also underscores the evolving nature of information management in the digital age and the value and the use of information by organizations. Traditional top-down hierarchical dissemination in favor of more collaborative and transparent approaches are challenged by these findings.
6. Trust as a Foundation: The interviews underscore the importance of trust as a foundational element in leadership and employee engagement. This especially important in challenging times as we currently experience. Trust-building strategies can foster a positive work environment.
7. IT Management in Digital Transformation: Even so most interviewees didn't have direct experience with IT managers they discussed about IT management's strategic role, the need for collaboration and cross-functional knowledge as well as service. These findings offer a understanding of the special challenges and characteristics of IT management compared to other C-level roles.

These insights offer starting points for future research and practical management, and foster innovation in the field of management science.

2.6. Discussion and interpretation of findings from qualitative literature analysis and expert interviews

Based on the literature analysis and the in-depth interviews, the author has identified both commonalities and differences in the viewpoints of the interviewees. This is true for incentive management systems, and for factors influencing work motivation and job satisfaction.

Commonalities:

8. Communication and decision-making: Both the literature and interviewees describe the importance of effective communication, clear decision-making processes, and streamlined reporting lines. These factors are seen as influence factors on work attitudes.
9. Organizational culture and leadership: The role of organizational culture and leadership styles is consistently recognized in shaping work attitudes. A positive culture,

supportive leadership, and an environment that encourages purposefulness are see to be essential for developing job satisfaction.

10. Performance evaluation and recognition: A fair and transparent performance evaluation processes, together with financial and non financial rewards and recognition, are considered as motivators by literature and interviews.
11. Procedural clarity: Interviewees and the literature suggest procedural clarity, including clear task allocation, transparent responsibilities, and reliable processes. Such clarity enhances trust and in turn work attitudes like satisfaction and motivation.

Differences:

1. Approaches to incentives: Both sources see the importance of incentives. Yet, there are variations in how incentives should be structured. Scholars discuss the need for a various approaches, including monetary and non-monetary incentives. In contrary the individual participants of the interview have different views on the types and structures of incentives.
2. Leadership styles: One of the interviewees suggested to tailor procedural factors to different leadership personalities. Among them narcissistic or empathetic leaders. This is not as prominently mentioned in the used literature.
3. Goal-setting and alignment: One of the interviewees stressed the role of goal-setting and alignment with the organization's mission and vision. This was which is not as prominent in the other responses.
4. Feedback and continuous improvement: One Interviewee highlights the importance of a structured feedback and continuous improvement processes. He assumed a positive impact on work attitudes. This aspect is not extensively covered in the used literature.
5. Decision accountability and delegation: One Interviewee discusses decision accountability and delegation. It was stated that autonomy in decision-making can positively influence work attitudes of employees. This perspective is not explicitly mentioned in the utilized literature.

Overall the results show the importance of aligning procedural factors with organizational objectives.

The owners association perspective prefers a structured and goal-oriented approach, while the workers association perspective takes a more holistic view considering different aspects of organizational dynamics.

2.7.Development of research model and hypotheses formulation

Based on Principal-Agent-Theory literature and CIO literature, a conceptual model to investigate the contribution of principal-agent management measures on work motivation and job satisfaction was designed (See figure 2-5). These management measures aim at the one side to reduce moral hazard and on the other side to reduce information asymmetry.

Management measures to reduce information asymmetry consist of two measurement constructs:

a) the perceived mutual understanding (PAM) looks into the alignment between the principal and his agent on different work and strategy-related topics.
b) Business IT alignment (BITA) examines alignment within the CIO's management level. As part of the top management team, IT managers engage in a triadic principal-agent relationship with their management peers, who are also internal customers of the CIO. This requires understanding their peers' needs, the company's strategic goals, and aligning these with IT strategy, development, and operation. To assess these alignments, CIOs are queried about the methods and intensity of their execution of the business IT alignment (BITA) process.

The principal-agent theory suggests that information asymmetry may lead to moral hazard, advocating for management measures to curb counterproductive behaviors. In this study, two concepts by Park (Park, 2010) are employed to assess these influences. Agent performance is gauged through a performance management system (PMS), often the basis for a monetary incentive system (MIS). Motivated and satisfied managers enhance organizational success. The model examines the impact of independent variables (IV) on CIO attitudes and "Job Satisfaction" (JS), enriched with two moderator variables (MV) covering hygiene factors (Herzberg). "Agent Trust in Principal" (PAT) reflects the personal relationship with the principal, with poor relationships potentially serving as demotivators.(Herzberg et al., 2010) (Damij et al., 2015).

The “Principal IT Knowledge” (PIK) describes the principles’ understanding of the agent's work environment and work content. In case this is understanding is lacking it might act as a demotivator.

As control variables (CV) (confounders) three measurement constructs have been developed and measured. The “KPI Usage Score” (KUS) describes if and how the performance of the IT department is measured and “IT Effectivity” (Effec) describes how the IT effectiveness helps the business, CIO direct reports (LS) is a measure for the leadership span of the CIO.

Research questions and hypothesis formulation

The main research questions for this study are as follows:

1. What Principal Agent related measures for reducing problems contribute to the attitudes of Chief Information Officers?
2. Are there any moderating effects of hygiene factors on the relationship between PA-related problem reduction measures and CIO attitudes?

These research questions have led to the development of the main hypotheses H_0 and the three summarizing hypotheses (H_A, H_B, and H_C) driving the overall research:

H_0: Management factors have an effect on the attitudes of top information technology managers.

The first research question corresponds to the first summarizing hypothesis (H_A):

H_A: Reduction measures of principal agent related problems have an impact on CIO attitudes.

Aligned with the first summarizing hypothesis and the second research question, the following additional propositions have been developed as a basis for all research and analysis:

- Trust in the principal and their IT knowledge have an impact on the relationship described in the first main hypothesis (H_A).

Both propositions lead to the development of the second and third summarizing hypotheses (H_B and H_C).

H_B: Agent trust in principle has a moderating effect on the association between principal agent related problem reduction measures and CIO attitudes. H_C: Principals' IT knowledge has a moderating effect on the association between principal agent related problem reduction measures and CIO attitudes.

In the due course the summarizing hypotheses will be broken down into blocks of detailed hypotheses which can be tested individually using statistical calculations.

Presentation of research model

The research model (see Figure 2-5) is based on the research questions and main hypotheses generated from them. It outlines the operationalization of the independent, dependent, moderator, and control variables, as well as the precise specification of the main hypotheses or detailed hypotheses.

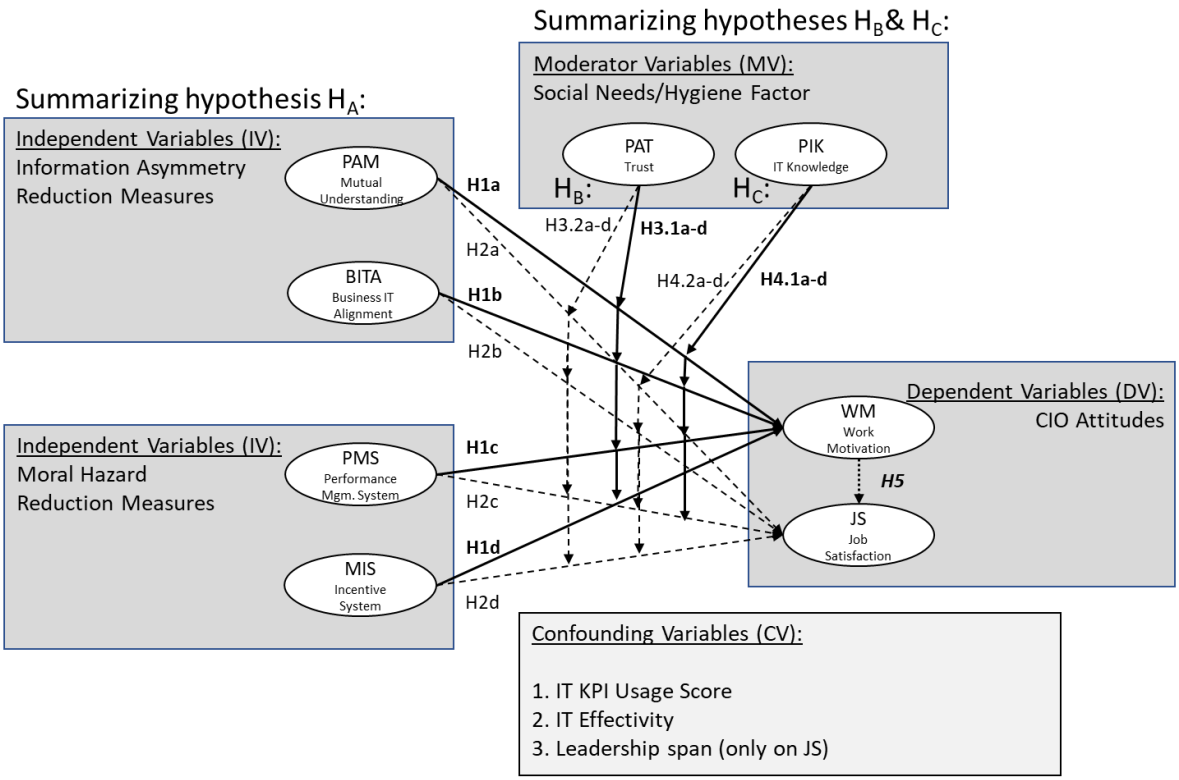


Figure 2-5: Research Model with main effects and moderator effects including the links to the developed hypotheses
Source: Author's construction

In the first hypothesis block H1a-d, the aim is to test if assumptions can be confirmed with the samples examined in the quantitative study. Work motivation will be assessed by the CIOs themselves via an online questionnaire.

Hypothesis 1:

a: Mutual understanding will positively affect CIOs' work motivation.

b: Business IT alignment will positively affect CIOs' work motivation.

c: A well-designed and operated performance management system will positively affect CIOs' work motivation.

d: A fair and well-operated monetary incentive system will positively affect CIOs' work motivation.

In the second hypothesis block H2a-d, the aim is to test if assumptions can be confirmed with the samples examined in the quantitative study. Job satisfaction will be assessed by the CIOs themselves via an online questionnaire.

Hypothesis 2:

a: A high level of mutual understanding will positively affect CIOs' job satisfaction.

b: A strong business IT alignment will positively affect CIOs' job satisfaction.

c: A well-designed and operated performance management system will positively affect CIOs' job satisfaction.

d: A fair and well-operated monetary incentive system will positively affect CIOs' job satisfaction.

In the course of the project, it is investigated whether the trust that CIOs have in their principal (PAT) affects the relationship between the independent and dependent variables. These specific hypotheses are designed to test the main hypothesis H_B, which suggests that agent trust in the principal moderates the link between PA-related problem reduction measures and CIO attitudes.

Hypothesis 3.1a-d

Agent trust in principle has a moderating effect on the association between information asymmetry & moral hazard reduction measures and work motivation.

Hypothesis 3.2a-d:

Agent trust in principle has a moderating effect on the association between information asymmetry & moral hazard reduction measures and job satisfaction.

Furthermore, this investigate whether the IT knowledge of the principal (PIK) impacts the relationship between the independent and dependent variables. These hypotheses have been developed to evaluate the main hypothesis H_C.

Hypothesis 4.1a-d:

Principal IT knowledge has a moderating effect on the association between information asymmetry & moral hazard reduction measures and work motivation.

Hypothesis 4.2 a-d:

Principal IT knowledge has a moderating effect on the association between information asymmetry & moral hazard reduction measures and job satisfaction.

As a secondary research goal arising from the research model, this research explores whether work motivation influences job satisfaction.

Hypothesis 5:

A high level of work motivation will positively affect CIO's job satisfaction

This chapter had two primary objectives: firstly, to assess the current state of research in the area of management work attitudes and secondly, to set the groundwork for future research endeavors. The author conducted independent content analyses of academic publications and complemented this with qualitative semi-structured in-depth interviews to validate the findings from the literature review. These interviews broadly investigated factors that influence work motivation and job satisfaction across various executive management groups, not limited solely to top IT management.

3. FACTORS INFLUENCING WORK-RELATED ATTITUDES – AN EMPIRICAL STUDY AMONG TOP IT MANAGERS

The previous sections explored the theoretical foundations of managerial attitudes. Furthermore, various factors impacting work motivation and job satisfaction underwent a thorough examination through a literature analysis. The findings were validated through expert interviews, leading to the development of a research model that elucidates these relationships. This third segment is devoted to empirically investigating specific factors influencing the work-related attitudes of top IT managers in German-speaking companies located in the DACH region. To achieve this, quantitative data were collected through an online survey and analyzed statistically using IBM SPSS (IBM Corp.). The goal of this empirical investigation is to deepen the understanding of the subject by providing empirical evidence to address research questions and test hypotheses.

3.1. Empirical mixed method research approach

The purpose of this research is to get in depth understanding of the perceived mutual understanding (PAM), business IT alignment (BITA), performance management system (PMS) and monetary incentive system (MIS) on job satisfaction (JS) and work motivation (WM) of CIOs. Tashakkori and Creswell defined a research method called mixed methods research, which they described as follows: “research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry” (Tashakkori and Creswell, 2007, p. 4). The exploratory sequential mixed method is the bases for this research (and its structure), as shown in Figure 3-1. Creswell (Creswell, 2014, Table 10.3) describes the expected outcomes of this research method as “A test of better measures for a sample of a population” which fits very well to the limitations of this study.

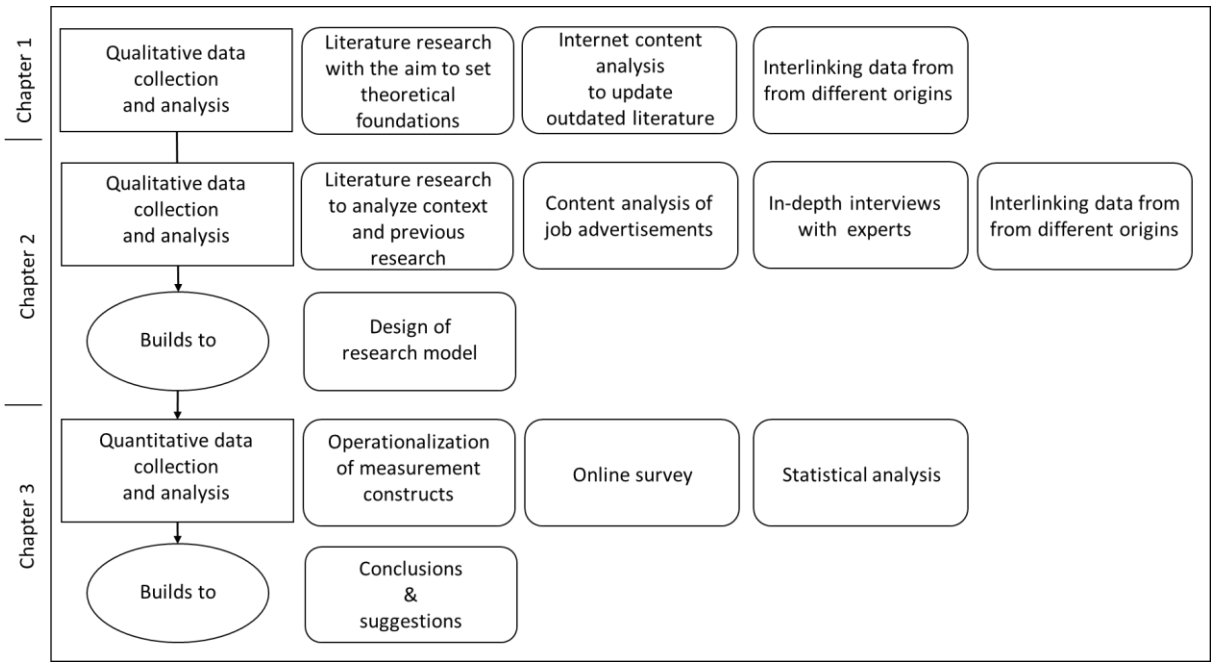


Figure 3-1: Exploratory sequential mixed method, by chapter, with detailed explanation of methods used

Source: created by the author, inspired by Creswell (Creswell, 2014, p. 270)

Literature research is a widely used research method in qualitative research. The result of a literature analysis depends strongly on the quantity and quality of the used primary sources. (Döring and Bortz, 2016, p. 906). The main aim of the literature analysis is to get a status quo of research in the area of CIO effectiveness research, which theories are relevant, to explore research methods and find significant controversies among scholars (Bryman and Bell, 2015, p. 101). Based on Dunleavy's (Dunleavy, 2003) as quoted in (Maylor, 2017, p. 388) focus-down strategy a broad overview of relevant literature was narrowed down. Additionally, literature research and selection was done with the Prisma method suggested by Moher et al. (Moher et al., 2015).

A qualitative pretest (Döring and Bortz, 2016, p. 411) of the quantitative questionnaire was conducted with selected privately known CIOs in October/November 2021 to evaluate if questions are understandable, questionnaire is clear, answering is comfortable, the order of questions makes sense, technology is in order.

Participants received the link to the online-based survey. To evaluate the questionnaire, 7 completed questionnaires were available. While no technical issues were reported, nine issues with the sensitivity of scales, units of open questions, length of questionnaire, and unclear answer options have been reported. All nine issues have been incorporated into the final questions. The general feedback from the experts has been positive apart from the relatively high number of questions.

A part of the target population of n=14 submitted the survey and the results have been screened, computed, and statistically validated. The results are documented in Appendix H.
The pilot study mostly followed the guidelines on web questionnaires Teddlie and Tashakkori (Teddlie and Tashakkori, 2008) as quoted in (Dillman et al., 2014, pp. 203–204), Dillman (Dillman et al., 2014, pp. 301–350) and Saleh/Bista (Saleh and Bista, 2017, p. 71).
Despite this pretest, participants of the main survey, reported some spelling errors, which have been corrected consequently while the survey was active.

3.2. Operationalization and description of measurement constructs

In this section, the cause, effect, and moderator variables are described. The various indicators are defined to operationalize them and make them measurable for empirical research. The main sources of the construct items are documented in Appendix G and detailed descriptive statistic of the variables used is documented in Appendix I.

Contribution to information asymmetry reduction measures

The contribution information asymmetry reduction measures consist of perceived principal agent mutual understanding and business IT alignment.

Perceived principal agent mutual understanding (PAM)

The variable Perceived Principal Agent Mutual Understanding (PAM) is a formative variable developed with input from various publications. The participant is asked how he rates the alignment between her/him and the direct manager. It consists of six items, measured on a five-point Likert scale.
The first four contains topic-based tasks, which are important for doing daily work of the IT manager as the business IT alignment, IT strategy & IT architecture, IT project portfolio & roadmap, and IT innovations & trends for use in the company. The items are derived from Hütter et al. statement that due to the lack of qualitative studies little is known about the effect of the CEO/CIO communication content on the CIO/CEO shared understanding (Hütter et al., 2016). Yet, he proposes that IT strategy, IT alignment, technical solutions to support the organization, and the transfer of business and IT knowledge are topics to consider. Based on this and the tasks of IT management (Krcmar, 2015) and the design dimensions of IT (Durst, 2007) the items have been chosen.
The fifth item is in regard to the proactivity of the CIO's actions. The sixth item rates the willingness to take risk.
Inspirations for two items have been taken from the publication of Johnson and Lederer (Johnson and Lederer, 2010) – In specific the aspects of riskiness and proactiveness. But also

the item of IT innovations and trends for use in the company can be associated with Johnson and Lederer's innovativeness.

Hütter et al. (Hütter et al., 2016)state that due to the lack of qualitative studies, little is known about the effect of the CEO/CIO communication content on the CIO/CEO shared understanding. Yet, he proposes that IT strategy, IT alignment, technical solutions to support the organization, and the transfer of business and IT knowledge are topics to consider. Based on this and the tasks of IT management (Krcmar, 2015, p. 107), the design dimensions of IT (Durst, 2007, p. 5).

In the survey, an index for the perceived principal agent mutual understanding (PAM) was built. The formative indicator which causes the latent variable (MacCallum and Browne, 1993, p. 533) includes all six sub questions. They were measured on a 5-point Likert scale rating from 1: not available to 5: very good.

1. Indicate how you rate the alignment between you and your manager in regard to Business IT Alignment. (PA01_09)
2. Indicate how you rate the alignment between you and your manager in regard to IT strategy and IT architecture. (PA01_01)
3. Indicate how you rate the alignment between you and your manager in regard to IT project portfolio and roadmap. (PA01_02)
4. Indicate how you rate the alignment between you and your manager in regard to IT Innovations and trends for your company. (PA01_04)
5. Indicate how you rate the alignment between you and your manager in regard to proactiveness of your actions. (PA01_05)
6. Indicate how you rate the alignment between you and your manager in regard to your willingness to take risk. (PA01_06)

The six questions (PA01_09, PA01_01, PA01_02, PA01_04, PA01_05, PA01_06) were merged to an index by calculating the mean value of the 6 original values *(PAM = MEAN.4(PA01_09, PA01_01, PA01_02, PA01_04, PA01_05, PA01_06)).* This was done in order to maintain the original scale. Appendix I-2 shows the histogram of the PAM index. The Cronbach Alpha is 0.881 with 6 items.

Business IT alignment (BITA)

The publication of Termer & Nissen (Termer and Nissen, 2013, p. 25) suggested a three-item business-IT-alignment variable. Termer later constructed an independent variable containing nineteen indicators among these the three business-IT-alignment indicators (Termer, 2015, pp. 109–110). For this research original four item scale was reduced by one item as it was targeting the employees of the CIO and their interaction with the business processes. The

remaining three items target the CIOs tasks directly and contain the intensity of IT and business strategy alignment, the intensity of the CIOs personal involvement in the development of the business strategy, and the perception of how much IT supports the business strategy. The items are measured on a five-point Likert scale rating from 1: not at all to 6: very good.

In the survey, an index for the business IT alignment (BITA) was built. The formative indicator includes the following questions regarding the process of business IT alignment:

1. How intensely do you align the IT strategy with the company strategy? (ST01_02)
2. How strong are you as the IT manager / CIO involved in the design of the company strategy? (ST01_03)
3. According to your view, rate to which extent does the company-IT support the strategy of the company? (ST01_04)

The three questions (ST01_02, ST01_03, ST01_04) were merged into an index by calculating the mean value of the 3 original values *(BITA = MEAN.2(ST01_02, ST01_03, ST01_04)).* This was done in order to maintain the original scale. Appendix I-3 shows the histogram of the BITA index. The Cronbach Alpha is 0.775 with 3 items.

Contribution to moral hazard reduction measures

The contribution of "Moral Hazard reduction measures" consists of the "Performance monitoring system" variable and the "Monetary incentive system" variable. The organizational effectiveness framework from Rainey and Steinbauer (Rainey and Steinbauer, 1999, pp. 403–437) suggests that incentive and monitoring can lead to higher levels of work motivation and organizational effectiveness. They state that "The more the task design in the agency provides extrinsic and intrinsic rewards to individuals and groups, the more effective the agency"

Performance management system (PMS)

The original study of Park (Park, 2010, pp. 435–436) suggests a performance monitoring system variable which measures by six questions from the survey, asking whether performance ratings accurately reflect CIO's performance and whether performance appraisal discussions and evaluation feedback helped improve employee's job performance.

The latent construct was statistically validated by Park. (Park, 2010, p. 435).

One question from park was excluded from the survey of this research as it was on a reversed answer scale and did not really fit to the other five questions in the context of a close CEO/CFO – CIO relationship.

> My supervisor really doesn't know enough about what I am doing to evaluate my performance accurately (reversed). *(MS01_08)*

In the survey, the questions for the performance management system have been translated to German, adapted to the new target group, and used according to the survey of Park (Park, 2010, p. 435) on a six-point Likert scale rating from 1: don't agree to 6: agree fully.

The reflective scales includes the following indicators:

1. Performance appraisal discussions are useful in helping me improve my performance. (*MS01_05)*
2. My supervisor's evaluation provides feedback that often helps me improve my job performance. (*MS01_06)*
3. My most recent performance rating accurately reflected my performance. (*MS01_07)*
4. My immediate supervisor works with me to set performance goals and targets. (*MS01_09)*
5. My supervisor is able to accurately determine different levels of employee performance. (*MS01_10)*

The five questions (*MS01_05, MS01_06, MS01_07, MS01_09, MS01_10*) were merged to an index by calculating the mean value of the 5 original values *(PMS = MEAN.3(MS01_05, MS01_06, MS01_07, MS01_09, MS01_10)).* This was done in order to maintain the original answer scale. Appendix I-4 shows the histogram of the PMS index. The Cronbach Alpha is 0.812 with 5 items.

Monetary incentive system (MIS**)**

The study of Park (Park, 2010, p. 435) also suggests a Monetary Incentive System (MIS) variable that measures whether CIO's Pay was really related to performance and whether high-performing employees were consistently rewarded with pay increases.

The latent construct was statistically validated by Park (Park, 2010, p. 435) .

In the survey, the questions for the Monetary Incentive System have been translated to German, adapted to the new target group, and used according to the survey of Park (Park, 2010, p. 435) on a six-point Likert scale rating from 1: don't agree to 6: agree fully.

The reflective indicator includes the following questions:

1. The pay-for-performance system of my company promotes the motivation of our employees. (MS01_01)
2. My pay is based on how well I do my job. (MS01_02)
3. Pay raises in my work unit often are not really related to performance (reversed). (MS01_03_rec)
4. High-performing employees in my work unit consistently are rewarded with pay increases greater than those awarded to average performing employees. MS01_04

The four questions (MS01_01, MS01_02, MS01_03_rec, MS01_04) were merged to an index by calculating the mean value of the 3 original values *(MIS = MEAN.3(MS01_01, MS01_02, MS01_03_rec, MS01_04).).* This was done in order to maintain the original scale. Appendix I-5 shows the histogram of the MIS index.

The Cronbach Alpha is 0.650 with 4 items. The Cronbach's Alpha is below the cutoff of 0.7, nevertheless it was accepted for the following reasons:

1. The scale is relatively short with only 4 items, the smaller the number of the items the lower the Cronbach's Alpha gets automatically (Cortina, 1993, p. 102).
2. Reversed Items result in a lower Cronbach's Alpha.

Contribution to chief Information officer attitudes

The contribution CIO attitude consists of work motivation and job satisfaction.

Work motivation (WM)

As a dependent variable, the work motivation (WM) variable was created originally by Park (Park, 2010, p. 436) and translated and adapted to the new target group by the author. The variable consists of four questions. Participants were asked about their opinion of their work was meaningful, the morale in the work unit, their own motivation regarding responsiveness, and the commitment of their own team.

The latent construct was statistically validated by Park (Park, 2010, p. 436).

The four indicators of this reflective scale are measured on a six-point Likert answer scale spanning from 1: don't agree to 6: agree fully.

1. I am doing work that is worthwhile (MS02_01)
2. Morale is high in my work unit (MS02_02)
3. I am motivated to respond swiftly to questions of customers and colleagues. (MS02_03)
4. My team is very engaged. (MS02_04)

The four questions (MS02_01, MS02_02, MS02_03, MS02_04) were merged to an index by calculating the mean value of the 4 original values *(WM = MEAN.3(MS02_01, MS02_02, MS02_03, MS02_04).* This was done in order to maintain the original scale. Appendix I-6 shows the histogram of the WM index The Cronbach Alpha is 0.720 with 4 items.

Job satisfaction (JS)

The second outcome variable is the job satisfaction (JS) variable created originally by Park (Park, 2010, p. 436) and translated and adapted by the author consisting of three questions regarding liking the own job, recommending the company to family members and friends, and deciding if the employer is a good place to work.

The latent construct was statistically validated by Park (Park, 2010, p. 436).

The three indicators of this reflective scale are measured on a six-point Likert answer scale spanning from 1: don't agree to 6: fully agree.

1. I like my job. (MS02_05)
2. I would recommend my employer to family members and friends. (MS02_06)
3. My employer is a good place to work. (MS02_07)

The three questions (MS02_05, MS02_06, MS02_07) were merged to an index by calculating the mean value of the 3 original values *(JS = MEAN.2(MS02_05, MS02_06, MS02_07).).* This was done in order to maintain the original scale. Appendix I-7 shows the histogram of the JS index. The Cronbach Alpha is 0.820 with 3 items.

Contribution to hygiene factors

Trust in principal (PAT)

The first moderator variable operationalizes trust to the CEO as perceived b CIO.

Arnitz et al. (Arnitz et al., 2017, p. 67) analyze the current status of CEO/CIO trust research and point to the fact that trust between the CIO and CEO is critical for business-IT-alignment. This in turn affects the performance of organizations (Gerow et al., 2014, p. 1178). The trust variable consists of three items first published by Podsakoff et al. (Podsakoff et al., 1990) in his "Trust in/ Loyalty to the Leader Scale" (Kraus and Kreitenweis, 2020; Podsakoff et al., 1990, p. 120). The latent constructs were statistically validated by Podsakoff with confirmatory factor analysis. (Podsakoff et al., 1990, p. 116)

The three indicators of this reflective scale are measured on a five-point Likert answer scale spanning from 1: don't agree to 5: fully agree.

1. I feel quite confident that my leader will always try to treat me fairly. (PA13_01)
2. My manager would never try to gain an advantage by deceiving workers. (PA13_02)
3. I have complete faith in the integrity of my manager/supervisor. (PA13_03)

The three questions (PA13_01, PA13_02, PA13_03) were merged to an index by calculating the mean value of the 3 original values *(PAT = MEAN.2(PA13_01, PA13_02, PA13_03)).* This was done in order to maintain the original scale. Appendix I-8 shows the histogram of the PAT index. The Cronbach Alpha is 0.913 with 3 items.

Principal IT Knowledge (PIK)

Paré et al. state that the IT knowledge of the top-management has a significant influence on the IT centrally (or in other words importance of the IT function) in organizations (Paré et al., 2020, p. 5, p. 8). Nissen and Termer (Nissen and Termer, 2014, p. 558) used a seven-point Likert scale summarizing the IT understanding of the overall top-management. Contrary to them this research constructed a moderator variable, the "Principal IT Knowledge" (PIK) variable, which

consists of two separate items asking the participant how he rates the general IT understanding covering both principal-agent relationships in which a CIO works on a daily basis. Firstly the disciplinary view were the participant answers regarding his direct superior manager, and secondly how he rates the general IT understanding of his customers and colleagues in the top management team. This is in alignment with the idea of Gurbaxany and Kemmerer (Gurbaxani and Kemerer, 1990, p. 282) see also Figure 2-1.

Both indicators of this reflective scale are measured on a five-point Likert scale rating from 1: not at all to 5: very good.

The indicators are measured by the following questions:

1. How do you rate the general IT understanding of your manager/supervisor? (*ST01_06)*
2. How do you rate the IT understanding of the remaining colleagues in the Top Management Team? (*ST01_05)*

The two questions (*ST01_06, ST01_05*) were merged to an index by calculating the mean value of the 2 original values *(PIK = MEAN.2(ST01_06, ST01_05))*This was done in order to maintain the original scale. Appendix I-9 shows the histogram of the PIK index.

The Cronbach Alpha is 0.606 with 2 items. The low Cronbach's Alpha was accepted as the scale only contains two items. The smaller the number of the items the lower the Cronbach's Alpha gets automatically (Cortina, 1993, p. 102).

Test of correlation between PAT and PIK:

A Pearson correlation test between the two moderator variables was done ($r= 0.381$, $p<0.001$). The correlation is positive and was of moderate strength.

Contribution of organizational influences (possible confounders)

The contribution of organizational influences consists of the KPI usage score, the IT Effectivity, and the IT department direct reports.

<u>Key performance indicator usage score (KUS)</u>

The first control variable operationalizes the usage of KPIs by the IT organization.

The participants were asked if their organization is measured by pre-defined metrics, in specific for IT service management, project management, financial KPIs of the IT function, and IT customer satisfaction. Answers for each question could be no =0, partly =1, and yes =2.

Based on the answers a formative KPI usage score was calculated by summing up all answer values, resulting in a scale from 0 to 8 according to the following formula:

KUS = MO04_01 + MO04_02 + MO04_03 + MO04_04. See

The indicator is based on the following four questions:

Are you and your organization measured according to predefined metrics?

1. IT Service Management (MO04_01)
2. Project Management (MO04_02)
3. Financial KPIs of the IT Department (MO04_03)
4. IT Customer Satisfaction(MO04_04)

Appendix I-10 for the histogram. The Cronbach's Alpha is 0.726 at 4 items.

IT effectivity (Effec)

The second covariate operationalizes the effectivity of the IT departments' offerings. Based on Durst (Durst, 2007, p. 94) IT departments can contribute in different ways to the success of the company. He describes that IT effectivity stands for improving the usage of IT which in turn supports directly the process performance of the company and the improved process performance directly supports the company's success (Termer, 2015, p. 114) (See also Figure 1-8). Termer (Termer, 2015, p. 150) designed ten indicators for measuring the business order of IT (Auftrag der IT). These were used unchanged in the current survey yet mapped manually to the IT drivers from the model of Durst (Durst, 2007, p. 94) (Figure 1-8).

Unfortunately, Termer used in his questionnaire a different word for Durst's IT-Effectivity which is quite misleading. So Termer's efficiency is the same as Durst's effectivity. For the rest of this research, the term efficiency is replaced by effectivity. The other two factors were called "Pioneer" and Support by Termer.

The items are measured on a five-point Likert scale rating from 1: not at all to 5: completely.

A: Innovative orientation of IT "Pioneer" / support of new business models

Questions:

1. Develop technological innovations (IM01_08)
2. Acquire new sources of turnover for the company (IM01_10)
3. Develop new products, markets, and business models (IM01_09)

B: Improvement of business processes "Effectivity"

Questions:

1. Optimize the IT-based interaction and communication (IM01_02)
2. Enable new professional opportunities by using IT (IM01_04)
3. Increase IT penetration in the Company (IM01_05)
4. Reduce the complexity of business processes (IM01_06)
5. Enable the capturing, processing, and usage of real-time data (IM01_07)

C: standardization, rationalization, and consolidation. "Support":

Questions:

1. Standardization, integration, and consolidation of IT(IM01_01)
2. Rationalize and optimize the IT operation (IM01_03)

The three categories from Termer's research (based on the exact same questions) are the result of an exploratory factor analysis based on his data (Termer, 2015, p. 150). His aim was to build a latent construct as a covariate. His idea was adapted for this research.

Termers category A is very dependent on the state of the company, its strategy, the industry, and many other factors and is therefore excluded by the author for further usage. This also applies to Question IM01_02 from category B.

First, the histograms for all involved variables have been investigated. (Appendix J)

As a next step, the factor structure was verified with own data (SPSS Code in Appendix J) and then some items were excluded as described in the following steps.

Termers category A is very dependent on the state of the company, its strategy, the industry, and many other factors and is therefore excluded by the author for further usage. This also applies to Question IM01_02 from category B.

In the explorative process of building a variable, the remaining items from categories B and C are used to do an exploratory factor analysis. The result is shown in table 3-1.

Table 3-1: Explorative factor analysis for IT effectivity (Effec) variable

Pattern Matrix[a]

	Factor	
	1	2
Enable new professional opportunities by using IT (IM01_04)	0.712	
Increase IT penetration in the Company (IM01_05)	0.640	
Enable the capturing, processing and usage of real-time data (IM01_07)	0.535	
Reduce the complexity of business processes (IM01_06)	0.483	
Standardize, integrate and consolidate IT (IM01_01)		0.606
Optimize and rationalize the IT operations (IM01_03)		0.594
Explained variance in %	38.404	18.986
Chronbach's Alpha	0.674	0.506

Extraction method: Principal axis factoring.
Rotation method: Oblimin with Kaiser normalization.
a. Rotation converged in 3 iterations.
The empty cells in the Table represent factor loadings of below 0.1.

Source: Authors' own construction

A principal axis factor analysis was conducted on the remaining 6 items with oblique rotation (Oblimin). The number of factors was determined using Kaiser's criterium (Eigenvalue >1). After three iterations the solution was accepted (Field, 2018, p. 918).

For factor 1, the loading of Item IM01_06 is only 0.483 and should be excluded according to Hair et al. (Hair, 2010, p. 105). Yet, the researcher accepted this item as the content of the item is central to the latent construct. Cronbach Alpha is a bit too small, but still can be accepted at four items. Table 3-3 shows that if IM01_06 would be deleted, Cronbach's Alpha would not increase. A slightly to small value for Cronbach's Alpha can be accepted if the content of the construct is relatively broad. According to Rammstedt et al. the low number of items per scale

and the intended heterogeneity, Crombach's Alpha is no suitable good estimator for the reliability of the scale(Rammstedt et al., 2013, p. 240).

The decision to keep the item in the scale is acceptable. Table 3-2 shows the Statistics for the chosen items.

Table 3-2: IT effectivity (Effec) control variable item statistics

Item-Total Statistics

	Cronbach's Alpha if Item Deleted
Enable new professional opportunities by using IT (IM01_04)	0.586
Increase IT penetration in the Company (IM01_05)	0.605
Reduce the complexity of business processes (IM01_06)	0.629
Enable the capturing, processing and usage of real-time data (IM01_07)	0.613

Source: Authors' own construction

Factor 1 contains the items: IM01_04 with a factor loading of 0.712, IM01_05 with 0.640, IM01_06 with 0.535, and IM01_07 with 0.483. Factor 1 is named IT effectivity (Effec).

According to Chun and Moony, (Chun and Mooney, 2009, p. 331) the first stage of the development of a CIO is "Deliver on promises". This means that category C standardization, rationalization, and consolidation is a common tasks of all CIOs. So factor 2 from our analysis which reflects category C form Termer (Termer, 2015, p. 150) is not used for further analysis in the research model due to a low Cronbach's Alpha of 0.506 with 2 items.

The remaining category B "Improvement of business processes" (IT Effectivity) (Factor 1) makes the difference as it enables the business to do its job right or in other words, improves process efficiency.

Therefore only questions from category B have been used in developing the variable.

The four remaining questions (IM01_04, IM01_05, IM01_06, IM01_07) were merged into an index by calculating the mean value of the four original values *(*Effec = MEAN.3(IM01_04, IM01_05, IM01_06, IM01_07).*)* This was done in order to maintain the original scale. Appendix I-11 shows the histogram of the Effec index. The Cronbach Alpha is 0.674 with 4 items. The Cronbach's Alpha is below the cutoff of 0.7, nevertheless, it was accepted for the following reason: The scale is relatively short with only 4 items, and the smaller the number of the items the lower the Cronbach's Alpha gets automatically (Cortina, 1993, p. 102). The SPSS calculation method of the covariate Effec is documented in Appendix J and the SPSS calculation method of the covariable is documented in Appendix M.

Leadership span (LS)

The third covariate operationalizes the managerial span of the CIO. The question asked was:

Q: How many IT Department Heads are directly reporting to you? (OR02_03)

Appendix I-12 shows the histogram of the LS scale. A test for Cronbach's Alpha is not necessary as this moderator is a simple scale from 1 to 7.

Age

The fourth covariable operationalizes the age (in 10-year categories) of the CIO. The question asked was:

Q: How old are you? (SD03)

Appendix I-13 shows the Age distribution of participants of the survey.

The relationship between Age and Gender on one side and work motivation and job satisfaction on the other side is not significant, Therefore the decision was made that age and gender are not used as control variables. Details can be found in Appendix N.

Test of applicability of control variables KUS, Effec, LS on WS and JS

Finally, a test of the applicability of the control variables KUS, Effec, LS and Age on work motivation (WM) and job satisfaction (JS) has been done. According to the correlation analysis, LS has a very weak and not statistically significant association with WM and is therefore excluded from the hypothesis tests for both main effects and moderator effects. Age has according to the correlation analysis a very weak and not statistically significant association with both WM and JS and is therefore also excluded from the hypothesis test for both main effects and moderator effects (see table 3-3).

Table 3-3: Correlation test of control variable leadership span (LS)

Pearson Correlation Matrix

		KUS IT specific KPI usage score (0-8)	Effec IT Effectivity	LS IT department heads directly reporting to CIO	Age in 10 year categories
WM Work Motivation	r	0.213**	0.383**	0.073	0.008
	p	0.007	<0.001	0.393	0.917
	N	158	162	140	161
JS Job Satisfaction	r	0.188*	0.248**	0.281**	0.143
	p	0.018	0.001	<0.001	0.071
	N	158	162	140	161

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

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

Source: own construction

The correlation matrix shows clearly that the control variable LS is not significant on WM and will therefore not be used in the testing.

3.3. Questionnaire design and data acquisition methods for the study

An online questionnaire was designed and distributed to survey participants in Germany. The approach was twofold. On the one side CIOs who were present on internet platforms with their work title were approached. On the other side companies with a minimum of 125 Mio€ turnover were extracted from a commercially available address database. This database returned contact names and e-mail addresses which also were used to approach the CIOs.

The second data source gives an indication of how big the overall population might be. Yet, as contact details of all potential CIOs are publicly available, and CIOs might have other job titles than the used one, the survey can hardly be representative. So the data available allows only an explorative study. Comparing the participation to earlier surveys in Germany suggest that the participation rate is acceptable and comparable (Nissen and Termer, 2014, p. 551).

Online questionnaire

The online questionnaire was generated using SoSci Survey (Leiner, 2019) and was made available to users via www.soscisurvey.de. The questionnaire was provided online only in a German version and contained 56 question blocks. The first question was intended to qualify if the participant qualifies for the questionnaire as an executive IT manager or CIO.

The online questionnaire was split into several logical parts, which have not been clearly separated for the survey participants. The focus of the first part was on Information about the company and the organizational integration of the IT function and the CIO role. The second part asked about the work attitudes of the CIO, namely work motivation, job satisfaction, and Turnover intention. Complemented with questions investigating possible influence factors on these work attitudes. The third part deals with CIO-specific information like demographics, skills, and income. Additionally, additional questions were asked about the nature of the IT department tasks and technical information about the IT department. The last 2 are not intended to be used in this research.

A twofold reward system was used to convince participants to start and fulfill the questionnaire (Saleh and Bista, 2017, p. 71). On one side a lottery and on the other side the option to receive updates and reports about the results of the survey.

N=300 Respondents used the German version of the questionnaire. The full questionnaire is attached in Appendix K including a English translation of the relevant questions used in the research in Appendix L.

Method of data acquisition

The target group for answering the questionnaire were current or former top-managers in a CIO or IT manager position. The former IT managers were asked in a preface to the survey to answer as if they were in their last assignment.

The CIO function is typically a more internally focused assignment of a company and rarely appears in the official files of a company or in the "About us" or "the management team" section of a company. Therefore a direct search on the internet will mostly only reveal outdated information based on press articles about cooperation with vendors, interviews, or sometimes press articles dealing with management replacements. Therefore other sources of information had to be identified.

In the period 26th Nov. 2021 to 21st March 2022 the survey was open for answering by contacted participants.

The first source of participants has been personal contacts to CIOs N=68. They were asked in a personal e-mail to redistribute the mail to potential secondary contacts which are CIOs. A total of N=15 participants started the survey.

The second source is a company database with a long tradition in the German-speaking countries originally called "Hoppenstedt Firmendatenbank". In the meantime renamed to "Bisnode DB" and now to "Dun & Bradstreet Wirtschaftsdatenbank" (Dun & Bradstreet Deutschland). The selection criteria for acquiring the addresses were:

1.) all industries in Germany excluding state offices, including state-owned companies.
2.) >125 Mio€ turnover per year. → N=7471

The database returned N= 3021 addresses of companies where the name and position of the IT top manager were registered.

This dataset contained N=2177 e-mail addresses. Unfortunately, these were mostly unspecific central IT addresses from the company post office.

A personalized e-mail, using the name of the potential CIO, was sent to all available addresses. Some e-mails were rejected either due to reasons of labor shortage, caused by COVID restrictions in the central post department or the reason that these companies, in line with their company regulations, generally do not participate in scientific surveys. The vast majority of e-mails were not answered. A total of N=48 started surveys could be registered.

The third source is a professional social network called CIO.de where CIOs register themselves as members with company information. The platform offers the possibility to write private messages to registered members. A total of N=150 CIOs have been contacted with a response rate of N=12.

The fourth source was the professional career networks LinkedIn and Xing. These providers offer the possibility to send private messages to unknown persons. Yet, this possibility has limitations. At the time when the survey was open the limitations were for LinkedIn a maximum of 250 contact attempts per week. Xing allows a maximum of 100 unanswered requests. This

limits the number of possible survey invitations and stretches the survey over a longer time. The invitation letter for the survey is documented in Appendix O.

On Xing, a total of N=121, and on LinkedIn N=840 messages to identified candidates have been sent. Overall N=3356 contact attempts across all channels were initiated.

According to the statistics function of the SoSci Survey a total of N=944 visits to the first page of the survey with the welcome text and the description of the research were noticed. A total of N=300 participants started the survey. As many questions were optional and asked about company-sensitive data and very personal data regarding income and relationship to the supervisor of the CIO, it was not expected that all datasets are 100% complete.

N=168 surveys were completely filled, which means including participation in the lottery and the newsletter. All datasets are used for statistical analyses in IBM SPSS 22 (IBM Corp.). See figure 3-4.

Table 3-4: Data on the population and the present sample

Population	**7471**			
Total sample	**3356**			44,92%
Participants	**300**		8,94%	4,02%
Datas sets used	**168**	56,00%	5,01%	2,25%

Source: author's own construction

A similar survey done by Nissen and Termer (Nissen and Termer, 2014, p. 551) had the same scope (CIOs in Germany, 3-month survey period, 2416 contact attempts by e-mail) and resulted in N=257 participations and N=216 valid datasets. The comparison with these results suggests that the response rate for the current survey is comparable and acceptable even so the ways of approaching the CIOs have changed from pure e-mail in 2013 to partly using social networks in 2022.

Descriptive statistics of participating top-IT-managers

As the basic population of CIOs in the DACH region is quite low, the researcher expected participants from different industries and company sizes. Different age groups of CIOs should be represented.

Gender of CIOs

CIOs with the gender male represented the highest portion of the answered sample (n= 153; 94.4 %). While women (n=8; 4.9%) and diverse people (n=1;0.6%) only represent a smaller part of the dataset. Termer and Nissen (Termer and Nissen, 2013, p. 13) found in a comparable survey from 2013 with 216 participants that male CIOs accounted for 92.1% of the participants. This is also in line with own research by Roscher and Nissen (Roscher and Nissen, 2021, p. 52) which shows that females in CIO positions are underrepresented. Gollenia (Gollenia, 2019,

p. 2) only reports 7% of female CIOs in the top 30 German DAX companies. Table 3-5 shows the results of this survey

Table 3-5: Gender distribution of top IT managers

		Frequency	Percent
Valid	female	8	4.9
	male	153	94.4
	divers	1	.6
	Total	162	100.0

Source: Author's own construction

Age of CIOs

A question in the survey asked the participants how old they are. Appendix I-13 shows the result.

Most CIOs are between 50 and 59 years, followed by the age group 40-49 years. Gollenia (Gollenia, 2019, p. 2) reported in 2019 in the group of DAX company CIOs an average age at the time of appointment of over 47 years, while the average age at the time of the study 2019 was 52 years. He reported a minimum age of 33 years and a maximum age of 63 years. Even so the sample is only 30 companies in his article, the results of this research can be seen as comparable. In own research empirical studies were identified which contained age information (Roscher and Nissen, 2021, p. 56). The method of data acquisition (age intervals) and presentation of the data is different in these 5 studies was different than in this research. The results are based on companies in North America. The result of these surveys shows a slightly younger population with a peak in the age corridor of 40-50 years. Preston at al. reports (Preston et al., 2008, p. 641) a mean age of 49.58 years (N=451) and Enns et al. (Enns et al., 2003, p. 474) an average age of 46.91 years (at a usable response of N=75).

Hierarchical level

Additionally, the participants were asked about their reporting structure in the company (Figure 3-2).

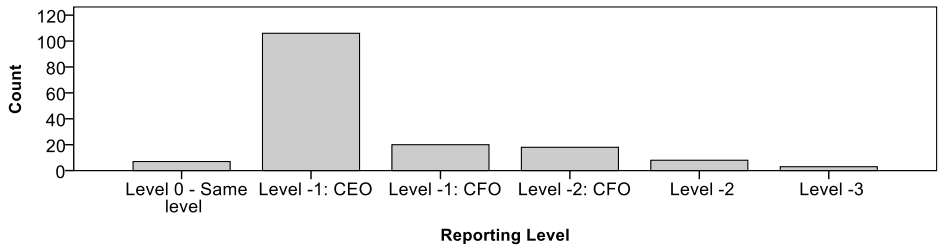


Figure 3-2: Hierarchical level of Top IT managers

Source: Author's own construction

In 2019 in German DAX 30 companies, only 25% reported directly to the CEO and only 1 of the CIOs is on the board level (Gollenia, 2019). Nissen and Termer reported in 2013 that 47.2%

reported to the CEO and 31.5% to the CFO while 13.4% were a member of an executive board. (Nissen and Termer, 2014, p. 554)

Luftman et al. (Luftman et al., 2013, p. 363) reported in 2012 that in the US 43% reported to the CEO, 27% to the CFO, and 19% to the COO. For Europe they reported following numbers CEO: 51%, CFO:27%, COO:10%. On a global base (average) 49% reported to the CEO, 25% to the CFO and 13% to the COO.

The current numbers of this research suggest that there has been a shift towards reporting directly to the CEO. So the technology function may have more influence in the highest-level strategic discussion and decision-making.

Company size, industry of the company and strategic orientation of the organization

CIOs were employed in companies of all sizes in terms of turnover and employees. The results are shown in Appendix P.20. Especially DAX30 companies which are active worldwide explain the data outliers. The participants were asked about the industry in which they worked. Multiple answers were possible. Therefore the total number of answers exceeds the number of participants. Appendix P.21 gives an overview. Appendix P.22 shows the analysis regarding the strategic orientation of the participating companies.

IT knowledge of the principal

As described in Chapter 3.2.4 the IT knowledge of principal (PIK) consists of two questions and is combined into an index. Figure 3-3 shows the boxplot of the individual values and the combined moderator variable.

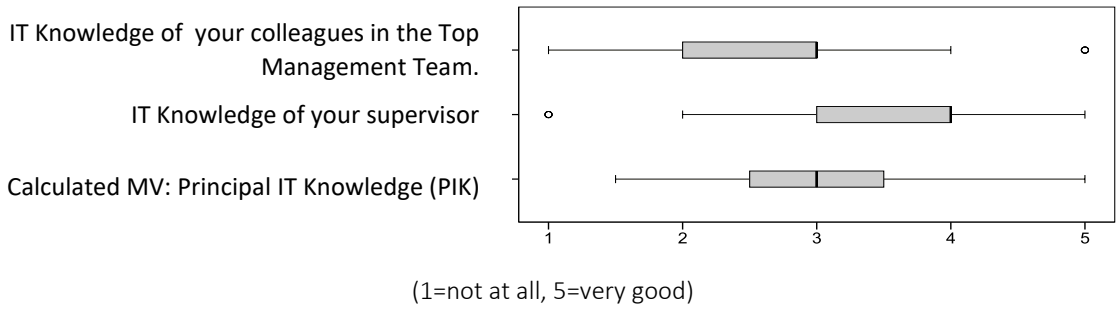


Figure 3-3: Boxplot of IT knowledge indicators

Source: Author's own construction

The boxplot shows clearly that the direct supervisor is rated higher in terms of IT knowledge than the other members of the top management team. Yet as business-IT-alignment is based on the idea that IT aligns with the business requirements of the different departments it is essential for this communication process that both parties have a certain level of IT and process understanding to be successful. Table 3-6 shows the correlations between the combined PIK moderator variable to the strategic orientation of the company.

Table 3-6: Correlations between PIK and the strategic orientation of the companies.

Pearson Correlations for PIK on strategic orientation of companies								
		Research and Development	Technical Innovations	Business Modell Inovation	Process Innovation	Technology Leadership	Cost Leadership	Quality Leadership
PIK Principal IT Knowledge	Pearson Correlation	.242**	.352**	.360**	.287**	.292**	0,106	.234**
	Sig. (2-tailed)	0,002	0,000	0,000	0,000	0,000	0,182	0,003
	N	160	161	161	161	160	160	159

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

Source: Author's own construction

This analysis shows that the correlation between PIK and cost leadership is very weak.

The results also point to the assumption that successful business-IT-alignment might benefit from a basic IT understanding of the members of the top management team.

Additional descriptive statistics can be found in Appendix P.

Outcome and results of the used variables

The independent and dependent variables used in the model were statistically tested. The results for the dependent variables (WM and JS) as well as the independent variables (PMS, BITA, PMS, and MIS) are shown in table 3-7.

Table 3-7: Statistical description of dependent and independent variables

		Dependent Variables		Independent Variables			
		WM Work Motivation	**JS** Job Satisfaction	**PAM** Principal Agent Mutual Under-standing	**MIS** Monetary Incentive System	**PMS** Performance Monitoring System	**BITA** Business IT-Alignment
N	Valid	162	162	158	161	160	162
	Missing	0	0	4	1	2	0
Minimum		3.50	1.34	1.00	1.00	1.40	1.34
Maximum		6.00	6.00	5.00	5.75	6.00	5.00
Quartiles	25	5.00	4.34	3.17	2.75	3.60	3.58
	50	5.25	5.00	3.75	3.75	4.40	4.00
	75	5.75	6.00	4.17	4.25	5.00	4.34

WM, JS, MIS, and PMS: 1=do not agree at all, 6=fully agree; PAM and BITA: (1=not available, 5=very good)

Source: Author's own construction

The value distribution of the dependent variables is very skewed towards the upper part of the scale. The value distribution of the independent variables is less skewed. The Moderator variables were also described and evaluated. Results are reported in table 3-8.

Table 3-8: Moderator and control variable statistics

		Moderator Variables		Control Variables		
		PAT Principal Agent Trust	**PIK** Principal IT Knowledge	**KUS** IT specific KPI usage score (0-8)	**Effec** IT Effectivity (IM01)	**LS** IT department heads direct reporting (1-7)
N	Valid	161	161	158	162	140
	Missing	1	1	4	0	22
Minimum		1.00	1.50	0	2.00	1
Maximum		5.00	5.00	8	5.00	7
Quartiles	25	3.67	2.50	3	3.50	1
	50	4.34	3.00	4	4.00	3
	75	5.00	3.50	6	4.50	5

PAT: 1=do not agree at all, 6=fully agree; PIK (1=not at all , 5=very good);Effec: (1=not at all, 5=completely)
Source: Authors' own construction

The Pearson correlation matrix with values for r and p can be investigated in Appendix Q. The case numbers ranged from n=162 to n=158 cases except for the control variable LS with a lowest case number of n=137.

3.4.Statistical analysis procedures

The hypotheses are tested with linear regression with IBM SPSS Vers. 22 (IBM Corp.). As a tool the procedure PROCESS 4.2 for IBM SPSS Vers. 22 of Andrew Hayes (Hayes, 2022a) and procedure Unianova is utilized. Figure 3-4 describes the process of the statistical analysis.

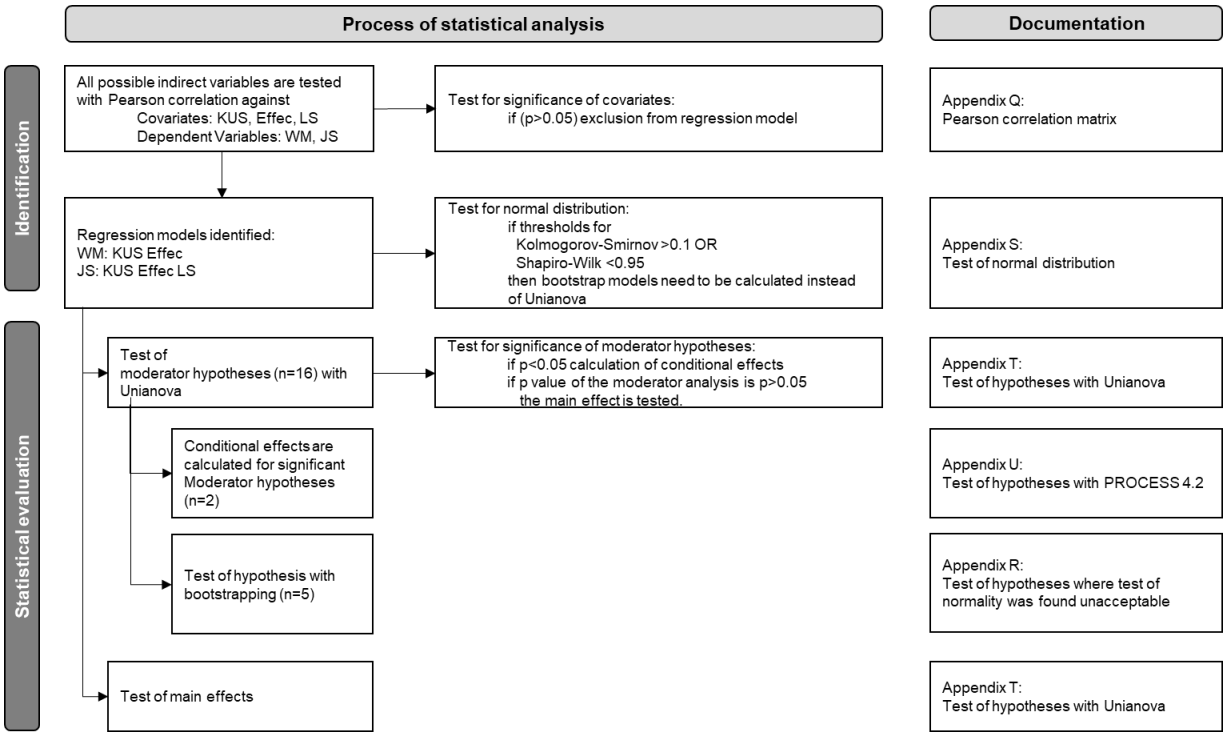


Figure 3-4: Process of statistical analysis

Source: Author's own construction

All possible covariates were tested by using a Pearson correlation matrix between these variables and the two dependent variables WM and JS. (Appendix Q)

If a covariate turned out to be not significant ($p>0.05$) it was not included in the regression models. As a result the covariates KUS and Effec were chosen for WM and the covariates KUS, Effec and LS for JS. This is in line with Pocock who stated: "Overall, what matters is to adjust for the appropriate covariates (that is, the strong predictors of outcome)" (Pocock et al., 2002, p. 2927).

Residuals are tested for normal distribution (Appendix S). Where possible problems were identified (based on Kolmogorov-Smirnov (<0.1) and Shapiro-Wilk >0.95 values, more robust models with bootstrap were calculated (see Appendix R) (Efron and Tibshirani, 1993, p. 266). Field (Field, 2018, Chapter 6.12.3) suggests that "… the best option, if you have irksome data [...] is to estimate parameters and their standard errors with methods that are robust to violations of assumptions and outliers". Field suggests the use of robust methods, either parameter estimates based on trimmed data or the bootstrap method.

This later method of bootstrapping has been chosen for the five cases (JS as the dependent variable) where the residuals deviated relatively strong from the normal distribution. This model was calculated with 1000 bootstrap replications (Pek et al., 2018, p. 7) using the BCa method (bias corrected and accelerated confidence interval) (Efron and Tibshirani, 1993, pp. 184-188, pp. 325-328). As suggested by Andy Field who quotes Efron & Tibshirani the BCa method is used. They suggest that "In terms of the options, SPSS will compute a 95% percentile confidence interval, but you can change the method to a slightly more accurate one calls a bias corrected and accelerated confidence interval" (Efron and Tibshirani, 1986, p. 54-58, p.72) (Efron and Tibshirani, 1993). The bootstrap calculation was done in SPSS v26 for Windows (IBM Corp.).

The first step of the statistical testing is to test the 16 moderator hypotheses (Aiken and West, 1996, pp. 28–48). Kam and Franzese state that for the interpretation of the moderator effect both variables must be included in the model (Kam and Franzese, 2007, pp. 99–102). This is also in line with the understanding of Angrist and Pischke (Angrist and Pischke, 2009, p. 38). The test is done with SPSS procedure Unianova and documented in Appendix T.

As the second step, the reported p values of all tests are observed and the significant interactions are additionally tested in Andrew Hayes PROCESS v.4.2 SPSS procedure (Hayes, 2022b) with centered variables to calculate conditional effects. The calculation is documented in Appendix U.

As the third step, the statistical testing of the main effect is carried out in those cases where the p-value of the moderator analysis is $p>0.05$. This test is done without the interaction and the

moderator variables PAT and PIK. The test is done with UNIANOVA and documented in Appendix T.

The conditional effects are interpreted if the moderator interactions were significant. Reported is the mean value +- 1SD plus the value of the moderator at which the effect becomes significant. In this case, the simple main effects are not interpreted.

All models report the following statistical values:

R^2 for the model, B (CI), p.ETA^2 and p, for the intercept and the involved variables.

p.ETA^2 is reported according to Cohen's suggestions: 0.01 small, 0.06 moderate, 0,14 large (Cohen, 1988, p. 283).

The confidence interval (CI) in this research is 95%.

Significance in this research is defined for all values $p<0.05$.

If p is between $p>=0.05$ and $p<0.1$ the results are interpreted as a trend.

Limitations: The results of the regression analysis can only be interpreted causally with caution, due to the endogeneity problem. Not all control variables are taken into account in the models, and unobserved or unknown confounding variables could affect the research model (Antonakis et al., 2010). In general, this research observes associations, not effects.

3.5.Results regarding hypotheses

In the following subchapters, the hypotheses are tested and answered. First the moderator hypotheses are tested, followed by the main effect hypotheses.

Moderator effect analysis regarding work motivation

Based on the research model (see Figure 2-5) and the specification of the detailed hypotheses the the moderator Hypotheses regarding work motivation H3.1a, H4.1a, H3.1b, H4.1, H3.1c H3.1d, H4.1c, and H4.1d are tested.

The detailed results of the statistical calculations can be found in the Appendix T (UNIANOVA) and Appendix R (UNIANOVA with bootstrapping).

The results, where the moderator hypothesis cannot be accepted based on the available data are summarized in Table 3-9 . For all accepted or partly accepted hypothesis tests the detailed results are provided in the text.

Table 3-9: List of unsupported moderator hypotheses

Hypo-thesis	Indirect Vairable	Moderator Variable	Direct Variable	B	(CI)	BCa 95% (1000 bootstrap samples)	p	p.Eta²
H3.1a	PAM	PAT	Work Motivation (WM)	0.076	(-0.018 - 0.170)		0.113	0.017
H3.1b	BITA	PAT	Work Motivation (WM)	0.063	(-0.013 - 0.140)		0.104	0.017
H3.1d	MIS	PAT	Work Motivation (WM)	0.036	(-0.039 - 0.112)		0.341	0.006
H3.2a	PAM	PAT	Job Satisfaction (JS)	-0.118		(-0.269 - 0.026)	0.123	0.015
H3.2b	BITA	PAT	Job Satisfaction (JS)	-0.112	(-0.242 - 0.018)		0.091	0.022
H3.2c	PMS	PAT	Job Satisfaction (JS)	0.059	(-0.052 - 0.171)		0.294	0.009
H4.1a	PAM	PIK	Work Motivation (WM)	0.026	(-0.090 - 0.143)		0.657	0.001
H4.1b	BITA	PIK	Work Motivation (WM)	0.010	(-0.100 - 0.121)		0.852	0.000
H4.1c	PMS	PIK	Work Motivation (WM)	0.044	(-0.038 - 0.126)		0.295	0.007
H4.1d	MIS	PIK	Work Motivation (WM)	0.043	(-0.048 - 0.135)		0.353	0.006
H4.2a	PAM	PIK	Job Satisfaction (JS)	-0.091	(-0.280 - 0.040)		0.318	0.005
H4.2b	BITA	PIK	Job Satisfaction (JS)	-0.085	(-0.307 - 0.169)		0.494	0.004
H4.2c	PMS	PIK	Job Satisfaction (JS)	0.006		(-0.151 - 0.180)	0.953	0.000
H4.2d	MIS	PIK	Job Satisfaction (JS)	-0.078	(-0.256 - 0.100)		0.385	0.006

Tested with UNIANOVA and UNIANOVA with bootstrap – details in Appendix R and Appendix T.

Source: Author's own construction

H3.1a: Results of the analysis regarding the interaction PAM → WM moderated by PAT: Regarding hypothesis H3.1a "Agent Trust in Principle (PAT) has a moderating effect on the association between Perceived Mutual Understanding (PAM) and the Work Motivation (WM).", the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H4.1a: Results of the analysis regarding the interaction PAM → WM moderated by PIK: Regarding hypothesis H4.1a "Principle IT Knowledge (PIK) has a moderating effect on the association between Perceived Mutual Understanding (PAM) and the Work Motivation (WM).", the result of the test is:

→ The moderator hypotheses cannot be accepted based on the available data.

H3.1b: Results of the analysis regarding the interaction BITA → WM moderated by PAT:

Regarding hypothesis H3.1b "Agent Trust in Principal (PAT) has a moderating effect on the association between Business IT Alignment (BITA) and the Work Motivation (WM).", the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H4.1b: Results of the analysis regarding the interaction BITA → WM moderated by PIK:

Regarding hypothesis H4.1b" Principal IT Knowledge (PIK) has a moderating effect on the association between Business IT Alignment (BITA) and the Work Motivation (WM).", the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H3.1c: Results of the analysis regarding the interaction PMS → WM moderated by PAT are shown Table 3-10.

Table 3-10: H3.1c tested with UNIANOVA

WM with PMS PAT KUS Effec			
	Moderator Analysis		
	B (CI)	p	p.Eta²
icept	4.486 (3.437 - 5.536)	<0.001	0.322
PMS	-0.125 (-0.380 - 0.130)	0.335	0.06
PAT	-0.205 (-0.459 - 0.050)	0.114	0.017
KUS	0.018 (-0.015 - 0.051)	0.290	0.007
Effec	0.246 (0.136 - 0.356)	<0.001	0.115
PAT*PMS	0.062 (0.000 - 0.124)	0.049	0.026
R^2	0.254		

Source: Author's own construction

Conditional effects are calculated for the moderator analysis in PROCESS 4.2. The results are shown in Figure 3-5.

PAT	B (CI)	p
3.002	0.062 (-0.038 - 0.162)	0.224
3.426	0.088 (0.000 - 0.177)	0.050
4.011	0.125 (0.041 - 0.209)	0.004
5.000	0.186 (0.078 - 0.295)	0.001
CI =95%		

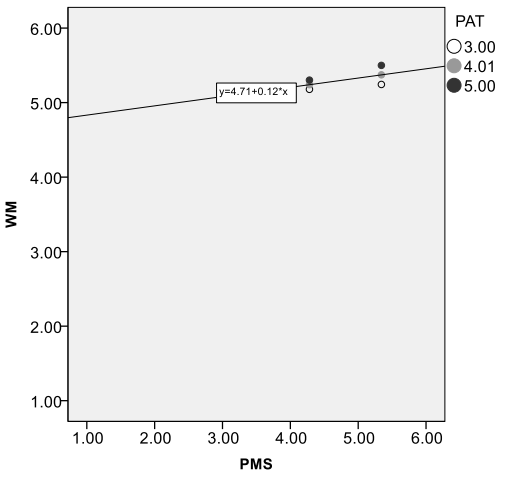


Figure 3-5: Conditional effects (+-1SD) H3.1c analyzed with PROCESS 4.2

Source: Author's own construction

Regarding hypothesis H3.1c "Agent Trust in Principle (PAT) has a moderating effect on the association between Performance Management System (PMS) and the Work Motivation (WM).", the result of the test is:

→The main interaction can be confirmed. There is a positive relationship between PMS and WM. The lower PAT, the weaker the positive relationship between PMS and WM. If PAT reaches values of >3.426 the relationship becomes significant.

Regarding hypothesis H1c "A well-designed and operated Performance Management System (PMS) will positively affect CIOs' Work Motivation (WM)."

The result of the test is:

As the moderator effect was accepted, the main effect should not be interpreted. It is confirmed for medium and high values of PAT, but with small values of PAT <3.426 the association becomes non-significant.

H4.1c: Results of the analysis regarding the interaction PMS → WM moderated by PIK:

Regarding hypothesis H4.1c" Principal IT Knowledge (PIK) has a moderating effect on the association between Performance Management System (PMS) and the Work Motivation (WM).", the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H3.1d: Results of the analysis regarding the interaction MIS → WM moderated by PAT:

Regarding hypothesis H3.1d"Agent Trust in Principal (PAT) has a moderating effect on the association between Monetary Incentive System (MIS) and the Work Motivation (WM).", the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H4.1d: Results of the analysis regarding the interaction MIS → WM moderated by PIK:

Regarding hypothesis H4.1d "Principal IT Knowledge (PIK) has a moderating effect on the association between Monetary Incentive System (MIS) and the Work Motivation (WM).", the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

Main effect analysis for information asymmetry reduction measures on work motivation

In a second step the main effect Hypotheses regarding work motivation H1a, H1b, H1c, and H1d are tested. See also Figure 2-5.

H1a: Results of the analysis regarding the interaction PAM → WM are shown in table 3-11.

Table 3-11: H1a tested with UNIANOVA

WM with PAM KUS Effec			
	Main Effect Analysis		
	B (CI)	p	p.Eta²
icept	3.680 (3.175 - 4.184)	<0.001	0.579
PAM	0.153 (0.051 - 0.255)	0.003	0.055
KUS	0.025 (-0.008 - 0.058)	0.137	0.015
Effec	0.234 (0.119 - 0.349)	<0.001	0.097
R^2	0.213		

Source: Author's own construction

Regarding hypothesis H1a "PAM will positively affect WM" the result of the test is:

→The available data does confirm H1a.

When PAM increases by one unit, the estimated value of WM increases on average by 0.153 with a confidence interval (0.051 – 0.255) with a small to medium effect size of $p.Eta^2$= 0.055 and a significance of p=0.003.

H1b: Results of the analysis regarding the interaction BITA → WM are shown in table 3-12.

Table 3-12: H1b tested with UNIANOVA

WM with BITA KUS Effec			
	Main Effect Analysis		
	B (CI)	p	p.Eta²
icept	3.655 (3.188 - 4.122)	<0.001	0.608
BITA	0.205 (0.110 - 0.300)	<0.001	0.105
KUS	0.023 (-0.009-0.054)	0.156	0.054
Effec	0.190 (0.076-0.304)	0.001	0.065
R^2	0.259		

Source: Author's own construction

Regarding hypothesis H1b "A high level of Business IT Alignment (BITA) will positively affect CIOs' Work Motivation (WM).", the result of the test is:

→The available data does confirm H1b.

When BITA increases by one unit, the estimated value of WM increases on average by 0.205 with a confidence interval (0.110 – 0.300) with a medium effect of $p.Eta^2$= 0.105 and a significance of p<0.001.

H1c: Conditional effects are calculated for the moderator analysis in PROCESS 4.2. The results are shown in Figure 3-21.

Regarding hypothesis H1c "A well-designed and operated Performance Management System will positively affect CIOs' Work Motivation."

The result of the test is: As the moderator effect was accepted, the main effect should not be interpreted. It is confirmed for medium and large values of PMS, but with small values of PMS <=3.426, the association becomes non-significant. For smaller values of PMS (mean PMS -

1SD = 3.002) the association is not significant B=0.062, CI (-0.038 – 0.162), p=0.224. At a PAT value of 3.426, the association between WM and PMS becomes stronger B=0.088 (0.000 – 0.177) and gains significance p=0.050. For mean values for PAT=4.011: when PMS increases by one point then job satisfaction increases by 0.125, (0.041 – 0.209), p=0.004. For maximum values of PAT=5.000 the association of WM and PMS is positive B=0.186, CI (-0.078 – 0.295), and highly significant p=0.001.

→The hypothesis is partly accepted for Pat values >3.426

H1d: Results of the analysis regarding the interaction MIS → WM are shown in Table 3-13.

Table 3-13: H1d tested with UNIANOVA

WM with MIS KUS Effec			
	Main Effect Analysis		
	B (CI)	p	p.Eta²
icept	3.829 (3.342 - 4.316)	<0.001	0.612
MIS	0.097 (0.018 - 0.176)	0.017	0.037
KUS	0.028 (-0.005 - 0.061)	0.096	0.018
Effec	0.250 (0.136 - 0.363)	<0.001	0.110
R^2	0.196		

Source: Author's own construction

Regarding hypothesis H1d "A fair and well-operated Monetary Incentive System will positively affect CIOs' Work Motivation (WM).", the result of the test is:

→The available data does confirm H1d.

When MIS increases by one unit, the estimated value of WM increases on average by 0.097 with a confidence interval (0.018 – 0.176) with a medium effect of p.Eta²= 0.037 and a significance of p=0.017.

Moderator and main effect analysis regarding job satisfaction

Based on the research model (Figure 2-5), the moderator Hypotheses regarding job satisfaction H3.2a, H4.2a, H3.2b, H4.2, H3.2c, H3.2d, H4.2c, and H4.2d are tested. The summary of the results can be found in Table 3-9 and the detailed UNIANOVA Results in Appendix R and Appendix T.

H3.2a: Results of the analysis regarding the interaction PAM → JS moderated by PAT:

Regarding hypothesis H3.2a "Agent Trust in Principle (PAT) has a moderating effect on the association between Perceived Mutual Understanding (PAM) and Job Satisfaction (JS).", the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H4.2a: Results of the analysis regarding the interaction PAM → JS moderated by PIK:

Regarding Hypothesis H4.2a "Principle IT Knowledge (PIK) has a moderating effect on the

association between Perceived Mutual Understanding (PAM) and Job Satisfaction (JS).“, the result of the test is:

→ The moderator hypotheses cannot be accepted based on the available data.

H3.2b: Results of the analysis regarding the interaction BITA → JS moderated by PAT:

Regarding hypothesis H3.2b “Agent Trust in Principal (PAT) has a moderating effect on the association between Business IT Alignment (BITA) and Job Satisfaction (JS).“, the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H4.2b: Results of the analysis regarding the interaction BITA → JS moderated by PIK:

Regarding hypothesis H4.2b“ Principal IT Knowledge (PIK) has a moderating effect on the association between Business IT Alignment (BITA) and the Job Satisfaction (JS).“, the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H3.2c: Results of the analysis regarding the interaction MIS → JS moderated by PAT:

Regarding hypothesis H3.2c “Agent Trust in Principle (PAT) has a moderating effect on the association between Performance Management System (PMS) and Job Satisfaction (JS).“, the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H4.2c: Results of the analysis regarding the interaction PMS → JS moderated by PIK:

Regarding hypothesis H4.2c“ Principal IT Knowledge (PIK) has a moderating effect on the association between Performance Management System (PMS) and Job Satisfaction (JS).“, the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

H3.2d: Results of the analysis regarding the interaction MIS → JS moderated by PAT are shown table 3-24.

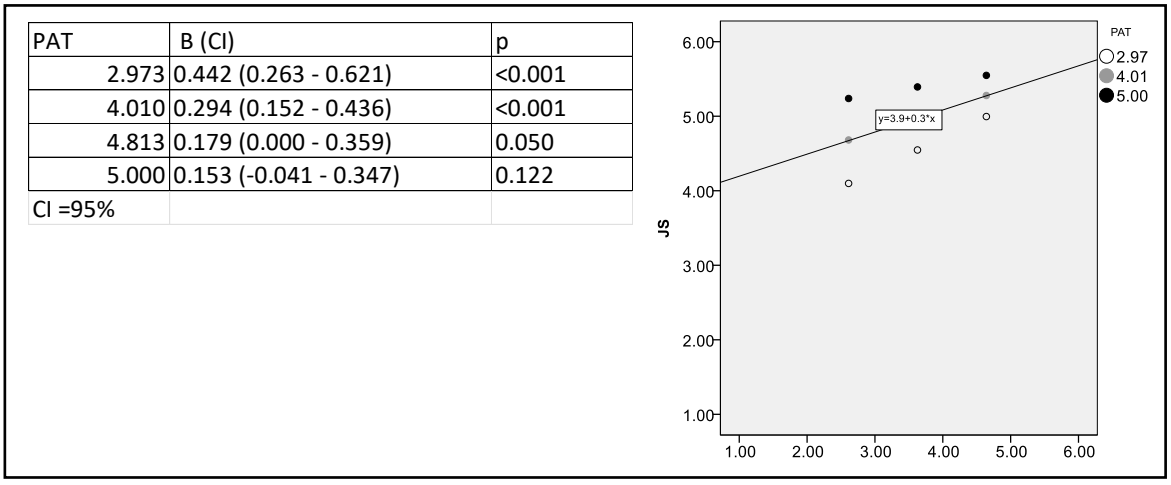
Table 3-14: H3.2d tested with UNIANOVA with bootstrap

Bootstrap for Parameter Estimates				
Dependent Variable:	Job Satisfaction			
		Bootstrap[a]		
		BCa 95% Confidence Interval	p	p.Eta²
Parameter	B			
Intercept	-0.786	(-2.771 - 0.806)	0.399	0.007
MIS	0.866	(0.380 - 1.480)	<0.001	0.088
PAT	0.935	(0.473 - 1.474)	<0.001	0.135
KUS	0.009	(-0.044 - 0.064)	0.763	0,001
Effec	0.173	(-0.026 - 0.384)	0.072	0.025
LS	0.068	(-0.003 - 0.145)	0.062	0.029
MIS * PAT	-0,143	(-0.277 - -0.034)	0.028	0.041
R^2	0.529			

[a.] bootstrap results are based on 1000 bootstrap samples

Source: Author's own construction

Conditional effects are calculated for the moderator analysis in PROCESS 4.2. The results are shown in figure 3-6.



PAT	B (CI)	p
2.973	0.442 (0.263 - 0.621)	<0.001
4.010	0.294 (0.152 - 0.436)	<0.001
4.813	0.179 (0.000 - 0.359)	0.050
5.000	0.153 (-0.041 - 0.347)	0.122
CI =95%		

Figure 3-6: Conditional Effects (+-1SD) H3.2d analyzed with PROCESS 4.2

Source: Author's own construction

Regarding hypothesis H3.2d "Agent Trust in Principle (PAT) has a moderating effect on the association between Monetary Incentive System (MIS) and the Job Satisfaction (JS).", the result of the test is:

→The main interaction was confirmed p=0.028 and p.Eta²=0.041. There is a positive relationship between MIS and JS. The higher PAT, the weaker the positive relationship between JS and MIS. If PAT reaches values of >4.813 the relationship becomes non-significant.

Regarding hypothesis H2d "A fair and well-operated Monetary Incentive System (MIS) will positively affect CIOs' Job Satisfaction (JS)."

The result of the test is:

As the moderator effect was accepted, the main effect should not be interpreted. It is confirmed for small and medium values of PAT, but with large values of PAT >=4.813, the association becomes non-significant.

H4.2d: Results of the analysis regarding the interaction MIS → JS moderated by PIK:

Regarding hypothesis H4.2d "Principal IT Knowledge (PIK) has a moderating effect on the association between Monetary Incentive System (MIS) and Job Satisfaction (JS).", the result of the test is:

→The moderator hypotheses cannot be accepted based on the available data.

Main effect analysis for information asymmetry reduction measures on job satisfaction

In a fourth step the main effect Hypotheses regarding job satisfaction H2a, H2b, H2c, and H2d are tested. See also Figure 2-5.

H2a: Results of the analysis regarding the Interaction PAM → JS are shown in table 3-15.

Table 3-15: H2a tested with UNIANOVA with bootstrap

Bootstrap for Parameter Estimates				
Dependent Variable:	Job Satisfaction			
		Bootstrap[a]		
		BCa 95% Confidence Interval	p	p.Eta²
Parameter	B			
Intercept	1.617	(0.697 - 2.426)	<0.001	0.072
PAM	0.635	(0.444 - 0.818)	<0.001	0.233
KUS	-0.006	(-0.080 - 0.070)	0.899	0.000
Effec	0.159	(-0.057 - 0.384)	0.122	0.015
LS	0.108	(0.030 - 0.184)	0.008	0.053
R^2	0.334			

[a.] bootstrap results are based on 1000 bootstrap samples

Source: Author's own construction

Regarding hypothesis H1a "Perceived Mutual Understanding (PAM) will positively affect CIOs' Job Satisfaction (JS).", the result of the test is:

→The available data does confirm H2a.

When PAM increases by one unit, the estimated value of JS increases on average by 0.635 with a confidence interval (0.436 – 0.835) with a large effect of $p.Eta^2$= 0.233 and a significance of p<0.001.

H2b: Results of the analysis regarding the Interaction BITA → JS are shown in table 3-16.

Table 3-16: H2b tested with UNIANOVA with bootstrap

Bootstrap for Parameter Estimates				
Dependent Variable:	Job Satisfaction			
		Bootstrap[a]		
		BCa 95% Confidence Interval	p	p.Eta²
Parameter	B			
Intercept	1.966	(0.803 - 3.064)	<0.001	0.107
BITA	0.553	(0.332 - 0.734)	<0.001	0.199
KUS	-0.018	(-0.081 - 0.057)	0.563	0.002
Effec	0.124	(-0.123 - 0.356)	0.292	0.008
LS	0.131	(0.051 - 0.206)	0.005	0.074
R^2	0.310			

[a.] bootstrap results are based on 1000 bootstrap samples

Source: Author's own construction

Regarding hypothesis H2b "A high level of Business IT Alignment (BITA) will positively affect CIOs' Job Satisfaction (JS).", the result of the test is:

→The available data does confirm H2b.

When BITA increases by one unit, the estimated value of JS increases on average by 0.553 with a confidence interval (0.362 – 0.744) with a large effect of $p.Eta^2 = 0.199$ and a significance of $p<0.001$.

H2c: Results of the analysis regarding the interaction PMS → JS are shown in Table 3-17.

Table 3-17: H2c tested with UNIANOVA with bootstrap

Bootstrap for Parameter Estimates				
Dependent Variable:	Job Satisfaction			
		Bootstrap[a]		
		BCa 95% Confidence Interval	p	p.Eta²
Parameter	B			
Intercept	1.259	(0.263 - 2.218)	0.009	0.040
PMS	0.473	(0.334 - 0.608)	<0.001	0.220
KUS	-0.044	(-0.126 - 0.045)	0.285	0.011
Effec	0.317	(0.130 - 0.505)	0.002	0.060
LS	0.166	(0.085 - 0.241)	<0.001	0.114
R^2	0.328			

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Source: Author's own construction

Regarding hypothesis H2c "A well-designed and operated Performance Management System (PMS) will positively affect CIOs' Job Satisfaction (JS). ", the result of the test is:

→The available data does confirm H2c.

When PMS increases by one unit, the estimated value of JS increases on average by 0.473 with a confidence interval (0.320 – 0.627) with a large effect of p.Eta²= 0.220 and a significance of p<0.001.

H2d: Results of the analysis regarding the Interaction MIS → JS.

Conditional effects are calculated for the moderator analysis in PROCESS 4.2. The results are shown in Figure 3-24.

Regarding hypothesis H2d "A fair and well-operated Monetary Incentive System (MIS) will positively affect CIOs' Job Satisfaction(JS)."

The result of the test is: as the moderator effect was accepted, the main effect should not be interpreted. It is confirmed for small and medium values of PAT, but with large values of PAT >=4.813, the association becomes non-significant. For relatively small values of PAT (mean PAT -1SD = 2.973) the association is relatively strong with B=0.442, CI (0.236 – 0.621), p<0.001. For mean values for PAT = 4.010: when MIS increases by one point then JS increases by 0.294, (0.152 – 0.436), p<0.001. At a PAT value of 4.813, the association between JS and MIS becomes weaker B=0.179 (0.000 – 0.359) and loses its significance at p=0.050. For maximum values of PAT 5.000 the association of JS and MIS still is positive B=0.152, CI (-0.041 – 0.347), yet not significant any more p=0.122.

→The hypothesis is partly accepted for Pat values <4.813

Main effect analysis for work motivation on job satisfaction

In a fifth step the main effect Hypotheses between work motivation and job satisfaction H5 is tested. See also Figure 2-5.

H5: The results of the analysis regarding the interaction WS → JS are shown in table 3-18.

Table 3-18: H5 tested with UNIANOVA

JS with WM KUS Effec LS			
	Main Effect Analysis		
	B (CI)	p	p.Eta²
icept	-1.043 (-2.575 - 0.489)	0.180	0.014
WM	0.969 (0.670 - 1.268)	<0.001	0.237
KUS	0.000 (-0.068 - 0.068)	0.991	0.000
Effec	0.108 (-0.118 - 0.334)	0.346	0.007
LS	0.130 (0.051 - 0.208)	<0.001	0.075
R²	0.343		

Source: Author's own construction

Regarding hypothesis H1d "A high level of Work Motivation will positively affect CIO's Job Satisfaction.", the result of the test is:

→The available data does confirm H5.

When WM increases by one unit, the estimated value of JS increases on average by 0.969 with a confidence interval (0.670 – 1,268) with a large effect of $p.Eta^2$= 0.237 and a significance of p<0.001.

3.6. Summary of empirical verification, discussion of findings and concluding analysis.

The author successfully demonstrated the reliability and validity of the research model. For a comprehensive understanding of the results of the hypothesis tests, please refer to Table 3-19 provided below.

Table 3-19: Summary of statistical evaluation about the relationship of factors influencing top IT managers work attitudes

Main Hypotheses	Moderator Hypothesis	IV		DV	B	p	p.Eta²	Hypotheses (supported / rejected)	Condition
H1a		Perceived Mutual Understanding (PAM)	→	Work Motivation (WM)	0.153	0.003	0.055	supported	
H1b		Business IT Alignment (BITA)	→	Work Motivation (WM)	0.205	<0.001	0.105	supported	
	H3.1c	Agent Trust in Principal (PAT)	↴					partly supported	for PAT >3.426
H1c		Performance Management System (PMS)	→	Work Motivation (WM)					
H1d		Monetary Incentive System (MIS)	→	Work Motivation (WM)	0.097	0.017	0.037	supported	
H2a		Perceived Mutual Understanding (PAM)	→	Job Satisfaction (JS)	0.635	<0.001	0.233	supported	
H2b		Business IT Alignment (BITA)	→	Job Satisfaction (JS)	0.553	<0.001	0.199	supported	
H2c		Performance Management System (PMS)	→	Job Satisfaction (JS)	0.473	<0.001	0.220	supported	
	H3.2d	Agent Trust in Principal (PAT)	↴					partly supported	for PAT < 4.813
H2d		Monetary Incentive System (MIS)	→	Job Satisfaction (JS)					
H5		Work Motivation (WM)	→	Job Satisfaction (JS)	0.969	<0.001	0.237	supported	
	H3.1a, b, d; H3.2a, b, c; H4.1a, b, c, d; H4.2a, b,	PAT (regarding WM); PAT (regarding JS); PIK (regarding WM); PIK (regarding JS)						not supported	

Source: Author's calculation with IBM SPSS

The detailed analysis regarding all hypotheses contribute to the answering of the three main hypotheses

These summarizing hypotheses were tested by detailed hypotheses in the course of this research:

Hypothesis H_A:

Reduction measures of principal agent related problems have an impact on top IT manager attitudes.

Results:

The first hypothesis H_A was tested by eight detailed hypotheses H1a-d and H2a-d.

The result of these detailed test were:

Hypotheses H1a, H1b, and H1d can be accepted. Hypothesis H1c is partially accepted for PAT values >3.426.

Hypotheses H2a, H2b, and H2c can be accepted. Hypothesis H2d is partly accepted for PAT values <4.813.

Consequently, the hypothesis H_A „Reduction measures of principal agent related problems have an impact on CIO attitudes." can mostly be confirmed.

Summary and discussion for H_A:

Based on the results of this study, the summarizing hypothesis H_A "Reduction measures of principal agent related problems have an impact on CIO attitudes" is largely supported. The analysis provides strong evidence in favor of the hypothesis.

While several scholars have identified the positive impact of mutual understanding between top IT managers and executive management on communication and company performance, there is limited knowledge concerning its effects on top managers' work motivation and job satisfaction (Arnitz et al., 2017, pp. 66–99; Benlian and Haffke, 2016, pp. 104–106; Johnson and Lederer, 2010, pp. 138–149; Stolk et al., 2016, pp. 180–191).The research wants to address this gap in understanding. The results support the hypotheses which is developed in response to this knowledge gap.

Similarly, the effects of business IT alignment have been explored in various directions in existing research. For example, Bi (Bi, 2020, p. 113) suggested that business IT alignment impacts the responsiveness of IT organizations, subsequently influencing company performance. Chebrolu and Ness (Chebrolu and Ness, 2013, p. 11) investigated the effects of business IT alignment on aspects of IT effectiveness. Yayla and Hu (Yayla and Hu, 2012, p. 382) provided strong evidence of a significant association between business IT alignment and performance measures of companies. The hypotheses proposing that business IT alignment positively affects the work attitudes of top IT managers contribute to this literature and provide clarity on the mechanisms through which companies can enhance performance through business IT alignment. Both hypotheses found support, particularly with a more pronounced effect on the job satisfaction of top IT managers.

The hypotheses regarding the effects of the performance management system and monetary incentive system on work motivation and job satisfaction were adapted from Park (Park, 2010, p. 418) The results of this thesis align to some extent with Park's findings. However, it's important to note that the level of trust a top IT manager has in their executive management moderates the impact of performance management systems on work motivation. Additionally, trust also moderates the impact of monetary incentive systems regarding job satisfaction. These moderating effects will be discussed in the following section.

The result of this quantitative research is in alignment with the results of the expert interview which also suggested fair and transparent performance evaluation coupled with a rewards and recognition system. Also the results regarding the information asymmetry reducing measures were identified, yet in a more generalized manner by the experts.

Hypotheses H_B:

Agent trust in principle has a moderating effect on the association between principal agent related problem reduction measures and top IT manager attitudes.

Results:

The second hypothesis H_B was tested by eight detailed hypotheses H3.1a-d and H3.2a-d.

The PAT-based moderator hypotheses H3.1a, H3.1b, H3.1d, H3.2a, H3.2.b, H3.2.c cannot be accepted. The moderator hypotheses H3.1c and H3.2d are supported.

Summary and discussion for H_B:

The results of this study show that the hypothesis H_B “Agent trust in principle has a moderating effect on the association between principal agent related problem reduction measures and CIO attitudes.” is partly supported.

Arnitz et al. (Arnitz et al., 2017, p. 78) initially defined the concept of "CIO trust in CEO" and employed it in an interview based study to explore the information-sharing behaviors of CIOs. Additionally, Hütter et al. (Hütter et al., 2017, p. 37) looked at the dual facets of trust existing between executive management and top IT management, underscoring its critical role in facilitating communication regarding strategic objectives. They also underscored the challenges of educational efforts in the absence of trust.

This leads the author to propose that trust can enhance communication between the principal and agent, promoting mutual understanding and facilitating efforts to achieve alignment between business and IT objectives. Furthermore, the author hypothesizes that trust in the supervisor also plays a moderating role in how agents perceive company-provided processes related to performance management and monetary incentive systems.

Regarding the authors' hypotheses about the moderating influence of trust in the principal, support can be discerned concerning the performance management system as follows: When

agents have a high level of trust in the principal, the performance management system is expected to exert a positive and statistically significant impact on work motivation.

Concerning the monetary incentive system, the moderator hypothesis finds partial support as follows: When trust values are in the medium to low range, management incentive systems tend to positively affect agents' job satisfaction.

Aligning and comparing the research findings from the survey with the expert interviews, the view of experts was that executive managers need to create an atmosphere to enable employees to feel safe and develop trust towards the supervisor. The interviews didn't explicitly mention that trust also has an influence on the perception of a procedural framework like the performance management system or the incentive management system. Yet, one interviewee stressed the role of trust in reliability. Processes can be seen as a form of standardized answer to common repetitive tasks and problems. Therefore, processes can be seen as very reliable, and employees can trust in the outcome of the process. Yet, on the other side of the medal, if an employee feels high trust in the manager the results of the quantitative research partly suggest that the trust towards a process or the organization as a whole is of less importance compared with the trust to the manager which is in line with the findings from the survey analysis.

Hypothesis H_C:

Principals' IT knowledge has a moderating effect on the association between principal agent related problem reduction measures and top IT manager attitudes.

Results:

The third hypothesis H_C was tested by eight detailed hypotheses H4.1a-d and H4.2a-d.

The PIK based moderator hypotheses H4.1a, H4.1b, H4.1c, H4.1d, H4.2a, H4.2b, H4.2c, H4.2d cannot be supported.

Summary and discussion for H_C:

The tests suggest that the hypothesis H_C "Principals' IT knowledge has a moderating effect on the association between principal agent related problem reduction measures and CIO attitudes." is not supported.

Paré et al. (Paré et al., 2020, p. 8). observed that top management's knowledge about IT has implications for how IT organizations are structured, particularly in terms of centrality. A higher degree of centrality in IT organizations enables top IT managers to operate more effectively and efficiently, as they have full control over all aspects of IT. Peppard (Peppard, 2010, pp. 81–82) analyzed that top managements IT knowledge or IT savviness influences the contribution of IT to the strategy of the organization, the IT operating model, the expectations towards the top manager and the involvement of the executive management in IT decision

making processes. This led the author to hypothesize that executives' IT knowledge might indirectly impact work-related attitudes, but this hypothesis could not be supported by the research.

According to Nissen and Termer (Nissen and Termer, 2014, p. 559), the more pronounced the IT understanding of top management is, the more likely IT leadership is involved in shaping the company's strategy through business IT alignment. The authors hypotheses that IT knowledge has a moderating impact on business IT alignment, mutual understanding and other factors could not be supported by this research.

From the results of the expert interviews, it was commonly agreed that subordinates' understanding of the CIO's role plays a crucial role in organizational success. The interviewees had the opinion that principals need to be in the position to ask meaningful questions without becoming mired in excessive detail. The author of this thesis would like to investigate this aspect in more detail: if a supervisor has too much knowledge about the top manager's work, the risk of engaging in micromanagement, question or even revise decisions of the subordinate increases. This typically results in demotivation and reduced job satisfaction, with a strong tendency to increase turnover intention.

Hypothesis H_5:

A high level of work motivation will positively affect top IT manager job satisfaction

Results:

Besides the Test of the main hypotheses, it was tested whether work motivation has an effect on job satisfaction.

Summary and discussion for H_5:

The secondary research hypothesis H_5 “A high level of Work Motivation will positively affect CIO’s Job Satisfaction” can be supported.

This aligns with the findings of Ahmed (Ahmed, 2011, p. 98), who observed that work motivation plays a key role in enhancing job satisfaction. Similarly, Park's research (Park, 2010, p. 424) employing a comparable research model also substantiates the positive and significant influence of work motivation on job satisfaction. Basalamah and As’ad (Basalamah and As’ad, 2021, p. 100) further corroborate this assertion in their own research. Additionally, Omar et al. (Omar et al., 2021, p. 211) arrived at a similar conclusion, noting that extrinsic motivational factors tend to exert a more substantial impact on employees' satisfaction in comparison to intrinsic motivational factors.

Overall the results of own research of the author and the research of other scholars suggest that if employees are motivated they will be more satisfied with their jobs.

The main hypothesis H_0:

Management factors have an effect on the attitudes of top information technology managers can be partly supported.

Summary and discussion for H_0:

The design of the organizational structure and culture, that minimizes opportunistic behavior is suggested by the principal-agent theory (Park, 2010, p. 425). This study which is mainly based on principal agent theory investigated two factors which are derived from the information asymmetry aspect of the principal agent model and two factors which are derived from the moral hazard aspect of the principal agent model. The factors are probed on work motivation and job satisfaction. These factors are known concepts for companies involved in the survey. Among the four effects, the study supports that perceived mutual understanding, business IT alignment and Performance management system have high effects on job satisfaction of the top IT managers, while Business IT alignment, performance management and monetary incentive systems have lower effect on work motivation. For performance management systems, it can be noted that for high trust levels there is a moderating effect on work motivation. Additionally, for the low trust levels the agent has towards his manager the relationship of the monetary incentive system on job satisfaction is moderated. Results suggest that the building of mutual understanding is the most effective measure to enhance job satisfaction, followed by a business IT alignment setup and a performance management system. Yet regarding work motivation business IT alignment has a greater effect on work motivation.

Model of Factors influencing work-related attitudes of managers:

The practical literature on work motivation and job satisfaction in management provides numerous useful recommendations for executive managers, supported by the data from this research. For instance, Jörg Lahmann (Lahmann, 2023, pp. 27–30) names several measures that either motivate or demotivate employed managers. Starting with the use of micromanagement by the supervisor, recognition of good performance, job security, leadership qualities, treatment of team members, communication, mood of the colleagues, and unfair payment.

As another example, Comelli (Comelli, 2014, p. VI) states that motivation first and foremost comes from within oneself, yet this is moderated by motivational factors from leadership, the task itself, the team, and the organization. Becker (Becker, 2019, p 118, pp 132-133) points out the importance of goals and incentives. He also describes traits of motivated employees and the importance of emotions regarding employees' motivation. Kleinhenz (Kleinhenz, 2015, p. 2) promotes dialogic management to raise employee job satisfaction. Kestler and Wehrhagen (Kestler and Wehrhagen, 2016, pp. 10–11) promote the idea of appreciation of employees to gain greater compliance regarding employee behavior. However, as discussed below, the findings of his research have several managerial implications in the IT area, not extensively

discussed in the extant literature. Figure 3-7 shows the model of factors and measures influencing top IT managers' work-related attitudes developed in this thesis.

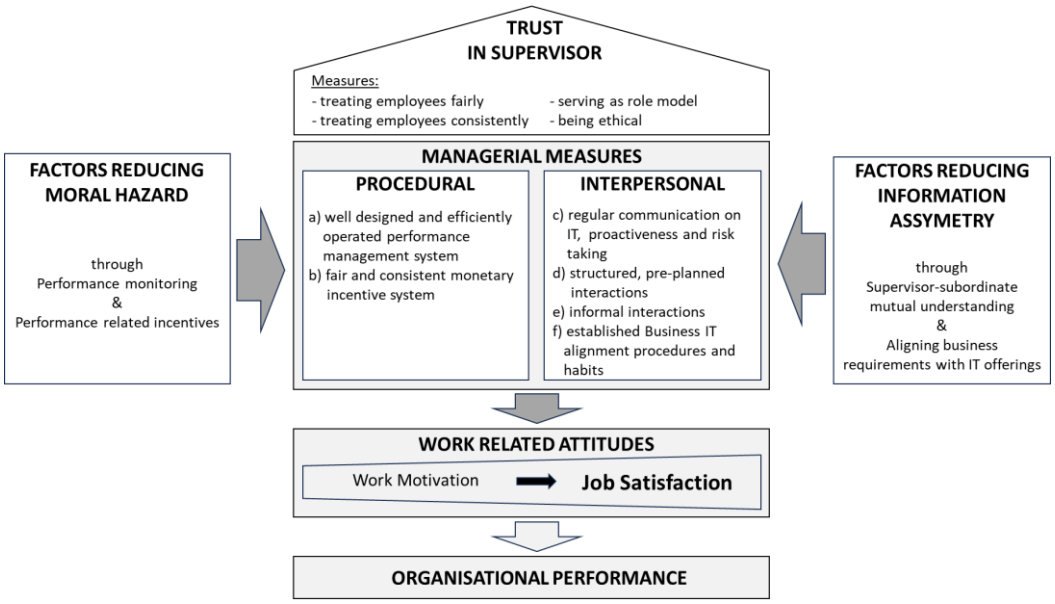


Figure 3-7: Model of factors and measures influencing top-IT-managers work-related attitudes

Source: Author's own construction based on research findings

This quantitative research designed and focused on two explicit factors in the area of information asymmetry and adapted two factors regarding moral hazard reduction measures from literature (Park, 2010, pp. 435–436), as well as moderating factors like principal's IT knowledge and trust in the supervisor. The result of this research shows that all investigated factors play a direct role in affecting work-related attitudes of top IT managers, in two cases moderated by trust. The result is in line with the quantitative results of the expert interviews, which mentioned all aspects of motivational factors investigated in this thesis. Among them, communication (as a basis for business IT alignment, mutual understanding, and building trust), performance evaluation and recognition, and procedural clarity.

Overall, the research model contributes to management science by examining the dynamics between IT management, executive management, trust, alignment of business and IT objectives, and the impact on work motivation and job satisfaction.

Implementation:

Finally the managerial measures from Figure 3-7 should be implemented in organizations in order to contribute to the performance of the IT organization and the organization as a whole. The following subchapter gives a suggestion for organizations on how to implement the findings of this research. Figure 3-8 shows a process based on an Plan-Do-Check-Act (PDCA) Cycle which is widely used in quality related management systems as it is easy to use (Koskela et al., 2019, p. 1387). In order to incorporate the status quo it was decided to first observe the

current state by adapting the PDCA Cycle and utilizing the OPDCA version (Knop and Mielczarek, 2015, p. 65).

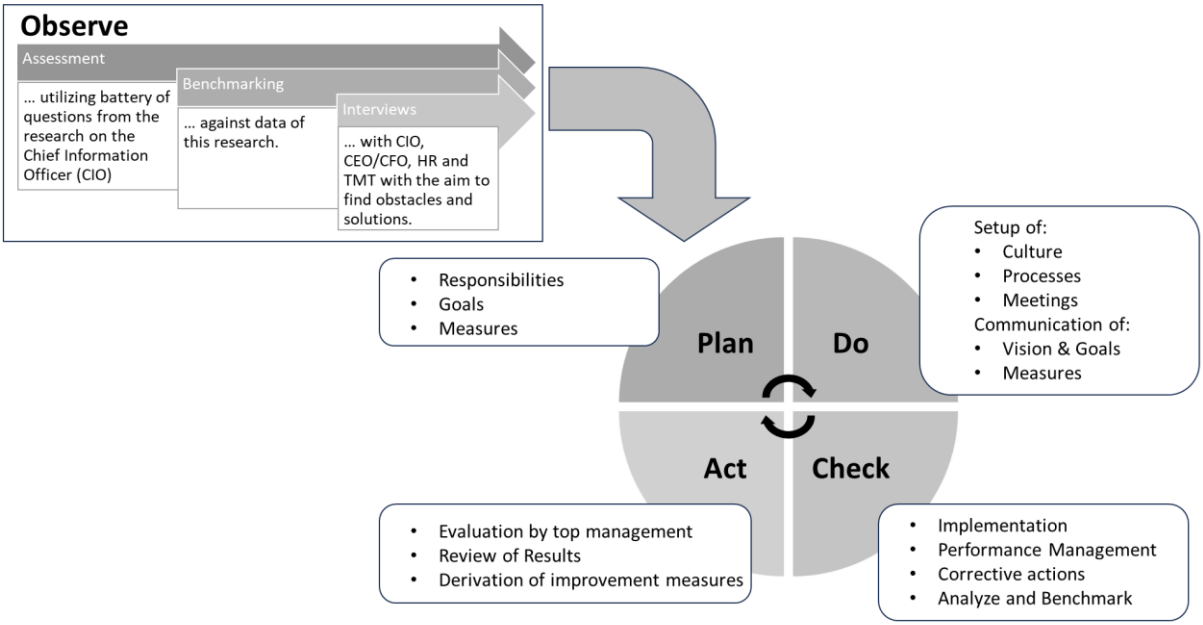


Figure 3-8: Implementation process to improve top-IT-managers work-related attitudes

Source: Author's own construction

In step one of the observe process organizations should assess the current status quo of the IT-manager work-related attitudes by utilizing the questions outlined in chapter 3.2. and calculate the mean value according to the calculation method described. In the benchmarking step these mean values can be compared with the statistical values presented in this research in Appendix I, with the aim to identify the individual situation of the IT Manager and the influencing factors in the company examined. The results of this assessment and benchmarking should then be used to conduct interviews with the executive management (e.g. CEO, CFO), human resources department (HR) and top management team members (TMT) with the aim to find current obstacles and ideas of improvement. The results from the observe process is the bases for the plan-do-check-act (PDCA) cycle.

In the plan step the participants of the implementation process agree on responsibilities, overall goals and specific measures of the improvement program.

In the do step the participants work on setting up the culture, processes and necessary meetings and agree on and carry out the communication of the overall vision, goals and specific measures to all relevant stakeholders.

In the check step the owner of the improvement process checks regularly the status of the implementation measures, the results from the performance management measurements. The

responsible person also controls the implementation of corrective measures and analyzes the results and benchmarks against the results of this research or with other companies.
Finally the act step involves an evaluation by the top management, the review of results and the derivation of improvement measures if possible. It the management and the respective top-IT-manager are happy with the outcome the improvement process could stop at this stage. If management feels that there still is room for improvement the process should be repeated.

CONCLUSION

The field of management science is enhanced by the research of this thesis by applying the principal-agent theory to top IT management, exploring managerial factors and their impact on work-related attitudes. It builds on and validates existing research while also introducing novel insights. In essence, this study has generated valuable and innovative findings. Drawing on these results, the author has formulated the following conclusions:

1. Research indicates that management factors, regardless of whether they originate from supervisors, organizations, or subordinates, exert a positive and significant influence on the work attitudes of subordinates.
2. The literature review reveals that previous research on top IT management has explored a wide range of mechanisms, mostly examined qualitatively, with only a limited amount of quantitative research. Notably, none of this research has focused on managerial factors that impact the drivers of work motivation and job satisfaction.
3. The structured content analysis of job advertisements shows that CIOs today are expected to take care of new demanding tasks in the area of finance and administration, innovation and architecture, and most importantly, business IT alignment.
4. The developed research model indicates that management factors provided by the principal, the organization as a whole, or the CIO can positively and significantly affect the CIO's work attitudes.
5. The research demonstrates that the perceived IT knowledge of the principal does not affect the relationship between managerial factors aimed at reducing information asymmetry (such as mutual understanding and business IT alignment) and measures for reducing moral hazard (such as performance management systems and monetary incentive systems) and top IT management attitudes towards work motivation and job satisfaction. This is both supported by answers from the expert interviews and the analysis of the survey results.

6. Cultivating a strong relationship between the top IT manager and the supervisor, characterized by a high level of perceived mutual understanding, with the principal (executive managers), has a minor impact on work motivation but a substantial influence on job satisfaction.
7. Establishing and maintaining a robust business IT alignment process has a moderate impact on work motivation and a significant effect on job satisfaction. As the business IT alignment is the basis for the planning and provision of IT offerings and IT services in the future, it becomes clear that it has a significant effect on job satisfaction. As in other areas of business life – if you see and experience that you are offering the right product to your customer and they are willing to purchase or use it, this creates immediate satisfaction with the responsible businessperson.
8. The presence of a well-designed and efficiently operated performance management system significantly affects work motivation, especially when perceived mutual understanding is high (PAT >3.426). The higher the PAT value, the stronger the association between the performance management system and work motivation. Or in other words: In the absence of trust in the manager, the effect of the Performance Management System on work motivation is weakened.
9. A well-designed and effectively operated performance management system has a substantial impact on job satisfaction. The answers from the expert interviews suggest that a fair and transparent performance evaluation process, coupled with rewards and recognition, is seen as motivators for top managers. All seven interviewees stressed procedural clarity, including clear task allocation, transparent responsibilities, and a reliable process. These are seen as the precondition for a positive impact on work-related attitudes. These expert opinions are supported by the results of the empirical analysis of the survey results.
10. A fair and well-operated monetary incentive system has a positive but relatively minor effect on top IT managers' work motivation. Some of the interviewees mentioned, besides the existence of a monetary incentive system, that recognition and rewarding employees with interesting challenges could be more motivating for top managers than monetary rewards.
11. The presence of a well-designed and effectively operated monetary incentive system significantly influences job satisfaction, particularly for lower values of perceived mutual understanding (PAT <4.813). The lower the PAT value, the stronger the association between the monetary incentive system and job satisfaction. Or in other

words: When there is a high level of trust in the manager, the effect of a monetary incentive system on job satisfaction diminishes.

12. Research shows that the KPI usage and the effectiveness of IT departments control for effects in the relationships both for work motivation and job satisfaction. Additionally, the number of direct reports to the CIO controls for effects only for job satisfaction.

SUGGESTIONS

Based on the research findings and the model built, the author provides the following recommendations:

For IT managers (agents):

1. Top IT managers should actively engage in communication with their superiors and the top management team to enhance mutual understanding and foster trust. Topics of these communications include alignment on business IT alignment, IT architecture, project portfolio and roadmap, and IT innovations and trends for the company. Additionally, the supervisor and the subordinate should discuss the proactiveness of the top IT managers as well as the willingness to take risks in decision making and daily operations.
2. Formalize the Business IT Alignment (BITA) process and strive for regular and frequent interaction with supervisors and the top management team. In detail, this means that the top IT manager needs to intensely align the IT strategy with the business strategy. Ideally, the CIO needs to be strongly involved in the design of the company strategy. It is especially true where digitization is the core of the business model of the company. Overall, the top IT executive needs to be self-reflective and aware of the extent to which the company IT supports the strategy and the business model of the organization.

For the board and executive managers (principals):

3. Foster mutual understanding between principals and top IT managers by dedicating regular time to structured, pre-planned interactions as well as informal settings. This should be in line with the content of the discussions described in suggestion 1.
4. Cultivate trust by treating employees fairly, refraining from deceptive practices, and serving as role models through ethical conduct. Detailed methodologies and tools to promote trust can be found in management literature. This research has looked at the result of these trust-building actions, and top IT managers have indicated that they need to feel confident that their leader will always try to treat them fairly and that their manager will not try to gain an advantage by deceiving employees. The result of all actions by the

executive supervising manager should be complete faith in the integrity of the CIO's manager.

5. Establish a well-designed and efficiently operated performance management system. This means that performance appraisal discussions and the evaluation feedback need to be useful in helping the manager to improve their performance. In order to promote trust, the performance rating needs to accurately reflect the manager's performance (without political and tactical influences). Additionally, the immediate supervisor needs to work together with the manager to set performance goals and targets. For achieving this, the supervisor needs to have the ability and skills to accurately determine different levels of subordinate performance.
6. Implement a fair and consistent monetary incentive system. The dimensions in achieving this are that the incentive system needs to build a pay-for-performance logic that promotes the motivation of employees. This means that the amount of payment needs to be based on how well the manager does their job. In general, the system needs to promote high-performing employees who are consistently rewarded with pay increases greater than those awarded to average-performing employees. It is important that pay raises are always related to performance.

<u>For human resource management:</u>

Typically, HR departments check in the screening process of the employment process topics like correctness of the CV (being proof of previous experiences, competences and skills (Roscher, 2021a)) . As the nature of the CIO role is very technical, the formal fit gap analysis of a potential candidate will focus on formal training (Roscher, 2020a), knowledge, and experience. All of them are important and necessary, yet as the CIO is the head of a service organization with many internal customers which have multiple, sometimes contradicting demands, it is of utmost importance that communication and negotiation skills are very well developed within the candidate. Therefore:

7. HR departments should, when hiring new top IT managers, clearly communicate the expectations regarding communication with executives and negotiation skills in job advertisements and interviews.
8. Assess communication and negotiation skills during the selection process to uncover hidden or even missing candidate attributes.
9. Offer communication and negotiation skills training to current top IT managers for better alignment with other top management and executives. If deficiencies in these skills are identified during performance appraisals, develop and introduce a HR-led improvement program involving training and mentoring to address and enhance these areas.

Implement streamlined and transparent performance management and monetary incentive systems by documenting and openly communicating the underlying processes company-wide. Clearly document, justify, and communicate any variations in processes for different ranks to enhance trust in the organization and top management.

For executive and top management training institutions:

11. Offer education and training programs for IT managers to enhance their communication skills, aiming to foster mutual understanding with executive management and the top management team. There are only a few CIO training programs internationally; most of them focus on operational and strategic topics. Also, practical literature on improving CIO communication is very limited (Anderson, 2018; Hütter et al., 2017).
12. Provide training for CIOs on the establishment and execution of an effective Business IT Alignment framework with a strong emphasis on communication and negotiation skills. Such courses also help build professional networks which help improve own knowledge by experience sharing. Even so, there are some commercial offers on the market (face-to-face and online or video courses); they mainly focus on the employee level below the top IT manager.

For authors of quality management norms and management excellence frameworks:

13. Incorporate elements that promote mutual understanding between IT and executive management to ensure consistency in decision-making in situations where no predefined processes and procedures are available. These elements could be a good and helpful addition to frameworks like ITIL/ISO20000, COBIT, or EFQM.
14. Encourage the adoption and continuous improvement of Business IT Alignment practices to enhance competitiveness. In frameworks like ITIL, there is a continuous improvement process in place that covers all areas of the framework, including the demand

Recommendations for researchers:

1. Investigate how various countries and cultures impact the relationship between management tools and the attitudes of top IT managers. This approach can expand the participant pool for statistical analysis. While the focus of this thesis is on top IT managers in German-speaking regions, findings from the literature analysis indicate diverse CIO age results when considering other global regions. This suggests potential variations driven by age, gender, and culture..
2. Broaden the scope of management instruments within the principal-agent model, incorporating elements such as bonding.
3. Extend the research to include other top management roles (acting as agents) and tailor information asymmetry reduction strategies accordingly.

4. Conduct research within matched pairs (supervisor and subordinate) or groups (top management team, direct reports), gathering insights from both principals and agents and cross-referencing survey results.
5. Investigate how top IT manager attitudes impact the organizational performance of the IT department and/or the organization as a whole.
6. Explore the effects of the frequency of interactions between principals and agents on top IT manager attitudes.

References

1. *5 Challenges CIOs and IT Leaders Are Facing in 2022* (2022) [Online]. Available at https://www.mavenwave.com/blog/5-challenges-cios-leaders-facing-2022/ (Accessed 9 December 2022).
2. Abrams, L. C., Cross, R., Lesser, E. and Levin, D. Z. (2003) 'Nurturing interpersonal trust in knowledge-sharing networks', *Academy of Management Perspectives*, vol. 17, no. 4, pp. 64–77.
3. Agnihotri, A. and Bhattacharya, S. (2022) 'TMT socio-demographic traits and employee satisfaction', *The International Journal of Human Resource Management*, vol. 33, no. 9, pp. 1719–1753.
4. Ahmed, I. (2011) 'Relationship between Motivation and Job Satisfaction: A Study of Higher Educational Institutions', *Journal of Economics and Behavioral Studies*, vol. 3, no. 2, pp. 94–100.
5. Aiken, L. S. and West, S. G. (1996) *Multiple regression: Testing and interpreting interactions*, 4th edn, Newbury Park, SAGE Publications.
6. Ajzen, I. and Fishbein, M. (2008) *Understanding attitudes and predicting social behavior*, Princeton, NJ.
7. Akerlof, G. A. (1970) 'The Market for "Lemons": Quality Uncertainty and the Market Mechanism', *The quarterly journal of economics*, vol. 84, no. 3, p. 488.
8. Akintola, O. and Chikoko, G. (2016) 'Factors influencing motivation and job satisfaction among supervisors of community health workers in marginalized communities in South Africa', *Human resources for health*, vol. 14, no. 1, p. 54.
9. Allport, G. W. (1935) 'Attitudes', in Murchison, C. (ed) *Handbook of Social Psychology*, Worcester, MA, pp. 798–844.
10. Alparslan, A. (2006) 'Grundzüge der Prinzipal-Agent-Theorie', in Adem Alparslan (ed) *Strukturalistische Prinzipal-Agent-Theorie*, Wiesbaden, DUV.
11. Amarilli, F., van den Hooff, B. and van Vliet, M. (2023) 'Business-IT alignment as a coevolution process: An empirical study', *The Journal of Strategic Information Systems*, vol. 32, no. 2, pp. 1–21.

12. Anderson, J. (2018) *Communication Skills That Every CIO Must Have: Tips and Techniques for CIOs to use in order to become better communicatiors*, CreateSpace Independent Publishing Platform.
13. Angrist, J. D. and Pischke, J.-S. (2009) *Mostly harmless econometrics: An empiricist's companion*, Princeton, Oxford, Princeton University Press.
14. Antonakis, J., Bendahan, S., Jacquart, P. and Lalive, R. (2010) 'On making causal claims: A review and recommendations', *The Leadership Quarterly*, vol. 21, no. 6, pp. 1086–1120.
15. Arnitz, T., Hütter, A. and Riedl, R. (2017) 'Mutual Trust between the Chief Information Officer and Chief Executive Officer:: Insights from an Exploratory Interview Study', *Journal of Information Technology Theory and Application*, vol. 18, no. 3, pp. 66–98.
16. Atteslander, P., Ulrich, G.-S. and Hadjar, A. (2023) *Methoden der empirischen Sozialforschung* [Online], 14th edn, Berlin, Erich Schmidt Verlag. Available at http://www.esv.info/978-3-503-21276-7.
17. Ayub, N. and Rafif, S. (2011) 'The relationship between work motivation and job satisfaction.', *Pakistan Business Review*, vol. 13, no. 2, pp. 332–347.
18. Azeem, M. A. and Quddus, M. A. (2014) 'Work Motivation and Job Satisfaction among Employees of Select Indian Universities: A Study with Special Reference to Interpersonal Relations', *IOSR Journal of Business and Management*, vol. 16, no. 4, pp. 72–80.
19. Bacharach, S. B. (1989) 'Organizational Theories: Some Criteria for Evaluation', *The Academy of Management Review*, vol. 14, no. 4, p. 496.
20. Baker, G. P., Jensen, M. C. and Murphy, K. J. (1988) 'Compensation and Incentives: Practice vs. Theory', *The Journal of Finance*, vol. 43, no. 3, p. 593.
21. Baker, T. (1996) 'On the Genealogy of Moral Hazard', *Texas Law Review*, vol. 75, no. 2, pp. 237–292 [Online]. Available at https://scholarship.law.upenn.edu/faculty_scholarship/872/.
22. Bakotić, D. (2015) 'Relationship between job satisfaction and organisational performance', *Economic Research-Ekonomska Istraživanja*, vol. 29, no. 1, pp. 118–130.
23. Banker, R. D., Hu, N., Pavlou, P. A. and Luftman, J. (2011) 'CIO REPORTING STRUCTURE, STRATEGIC POSITIONING, AND FIRM PERFORMANCE1', *MIS Quarterly*, vol. 35, no. 2, pp. 487–504.

24. Basalamah, M. S. A. and As'ad, A. (2021) 'The Role of Work Motivation and Work Environment in Improving Job Satisfaction', *Golden Ratio of Human Resource Management*, vol. 1, no. 2, pp. 94–103.

25. Becker, F. (2019) *Mitarbeiter wirksam motivieren: Mitarbeitermotivation mit der Macht der Psychologie*, Berlin, Springer.

26. Belfo, F. (2013) 'A Framework to Enhance Business and Information Technology Alignment Through Incentive Policy', *International Journal of Information Systems in the Service Sector*, vol. 5, no. 2, pp. 1–16.

27. Benardis, A., Hochreiter, Gerhard, Lang, Matthias and Mitterer, G. (2017) 'Auf zu neuen Ufern', *Harvard Business manager: Agiles Management*, vol. 17, no. 4, pp. 6–12.

28. Benlian, A. and Haffke, I. (2016) 'Does mutuality matter?: Examining the bilateral nature and effects of CEO–CIO mutual understanding', *The Journal of Strategic Information Systems*, vol. 25, no. 2, pp. 104–126.

29. Bennett, N. and Lemoine, G. J. (2014) 'What a difference a word makes: Understanding threats to performance in a VUCA world', *Business Horizons*, vol. 57, no. 3, pp. 311–317.

30. Bergh, D. D., Ketchen, D. J., Orlandi, I., Heugens, P. P. M. A. R. and Boyd, B. K. (2019) 'Information Asymmetry in Management Research: Past Accomplishments and Future Opportunities', *Journal of Management*, vol. 45, no. 1, pp. 122–158.

31. Bi, R. (2020) 'The Impact of IT-Business Alignment on SME Performance: The Mediating Effects of Strategic Collaboration, Coordination, and Responsiveness', *Electronic Journal of Information Systems Evaluation*, vol. 23, no. 1, pp. 112–125.

32. Binder, U. (2023) 'Controlling:: Aufgaben, Funktionen, Ziele' (4. Strategisches Controlling und strategische Unternehmensführung), in Haufe (ed) *Haufe Finance Office Premium (Online)*.

33. Bititci, U. S., Carrie, A. S. and McDevitt, L. (1997) 'Integrated performance measurement systems: A development guide', *International Journal of Operations & Production Management*, vol. 17, no. 5, pp. 522–534 [Online]. DOI: 10.1108/01443579710167230.

34. Bligh, M. C. (2017) 'Leadership and Trust', in Marques, J. and Dhiman, S. (eds) *Leadership Today*, Cham, Springer International Publishing, pp. 21–42.

35. Borden, K., Gupta, S., Weig, F. and Williams, J. (2018) *Why you need a CTO—and how to make her successful: Feeling unprepared for technical disruption? A well-structured*

role for a chief technology officer is a first line of defense. [Online]. Available at https://www.mckinsey.com/capabilities/operations/our-insights/why-you-need-a-cto-and-how-to-make-her-successful.

36. Bourne, M., Mills, J., Wilcox, M., Neely, A. and Platts, K. (2000) 'Designing, implementing and updating performance measurement systems', *International Journal of Operations & Production Management*, vol. 20, no. 7, pp. 754–771 [Online]. DOI: 10.1108/01443570010330739.

37. Boyce, C. and Neale, P. (2006) 'CONDUCTING IN-DEPTH INTERVIEWS:: A Guide for Designing and Conducting In-Depth Interviews for Evaluation Input', *Pathfinder International Tool Series*, Monitoring and Evaluation - 2, pp. 1–12.

38. Boynton, A. C., Zmud, R. W. and Jacobs, G. C. (1994) 'The Influence of IT Management Practice on IT Use in Large Organizations', *MIS Quarterly*, vol. 18, no. 3, pp. 299–318.

39. Brecht, U. (2012) *BWL für Führungskräfte: Was Entscheider im Unternehmen wissen müssen* [Online], 2nd edn, Wiesbaden, Springer Fachmedien Wiesbaden; Imprint: Springer Gabler. Available at https://ebookcentral.proquest.com/lib/kxp/detail.action?docID=1083305.

40. Brignall, S., Fitzgerald, L., Johnston, R., Silvestro, R. and Voss, C. (1991) 'Performance measurement in service businesses', *Management Accounting*, vol. 69, no. 10, pp. 34–36.

41. Broadbent, J. and Laughlin, R. (2009) 'Performance management systems: A conceptual model', *Management Accounting Research*, vol. 20, no. 4, pp. 283–295.

42. Brower, H. H., Lester, S. W., Korsgaard, M. A. and Dineen, B. R. (2009) 'A Closer Look at Trust Between Managers and Subordinates: Understanding the Effects of Both Trusting and Being Trusted on Subordinate Outcomes', *Journal of Management*, vol. 35, no. 2, pp. 327–347.

43. Brown, C. V., McLean, E. R. and Straub, D. W. (1996) 'Partnering Roles of the IS Executive', *Information Systems Management*, vol. 13, no. 2, pp. 14–18.

44. Brown, J. and Sheppard, B. (1997) 'Teacher-Librarians in learning organizations', *Proceedings of the Annual Conference of the International Association of School Librarianship,*, pp. 197–216.

45. Brunner, J. (1999) 'Value-based performance management: Wertsteigernde Unternehmensführung : Strategien, Instrumente, Praxisbeispiele' [Online]. Available at https://www.semanticscholar.org/paper/7afd96339ed99c014c1ff87d35ab5d4338bca737.

46. Bryman, A. and Bell, E. (2015) *Business research methods*, 4th edn, Oxford, Oxford Univ. Press.

47. Burke, C. S., Sims, D. E., Lazzara, E. H. and Salas, E. (2007) 'Trust in leadership: A multi-level review and integration', *The Leadership Quarterly*, vol. 18, no. 6, pp. 606–632.

48. Casadesus-Masanell, R. (2004) 'Trust in Agency', *Journal of Economics <html_ent glyph="@amp;" ascii="&"/> Management Strategy*, vol. 13, no. 3, pp. 375–404.

49. Chalmeta, R., Palomero, S. and Matilla, M. (2012) 'Methodology to develop a performance measurement system in small and medium-sized enterprises', *International Journal of Computer Integrated Manufacturing*, vol. 25, no. 8, pp. 716–740 [Online]. DOI: 10.1080/0951192x.2012.665178.

50. Chan, Y. E., Sabherwal, R. and Thatcher, J. B. (2006) 'Antecedents and outcomes of strategic IS alignment: An empirical investigation', *IEEE Transactions on Engineering Management*, vol. 53, no. 1, pp. 27–47.

51. Charas, S. (2015) 'Improving corporate performance by enhancing team dynamics at the board level', *International Journal of Disclosure and Governance*, vol. 12, no. 2, pp. 107–131.

52. Chebrolu, S. B. and Ness, L. (2013) 'How Does Alignment of Business and IT Strategies Impact Aspects of IT Effectiveness?', *International Journal of Applied Management and Technology*, vol. 12, no. 1, pp. 1–15.

53. Chen, Mocker, Preston and Teubner (2010) 'Information Systems Strategy: Reconceptualization, Measurement, and Implications', *MIS Quarterly*, vol. 34, no. 2, p. 233.

54. Chen, D. and Preston, D. (2007) 'Understanding CIO Role Effectiveness: The Antecedents and Consequents', *2007 40th Annual Hawaii International Conference on System Sciences (HICSS'07)*. Waikoloa, HI, USA, 03.01.2007 - 06.01.2007, IEEE, 237a-237a.

55. Chen, Y.-C. and Wu, J.-H. (2011) 'IT management capability and its impact on the performance of a CIO', *Information & Management*, vol. 48, 4-5, pp. 145–156.

56. Chenhall, R. H. (2003) 'Management control systems design within its organizational context: findings from contingency-based research and directions for the future', *Accounting, Organizations and Society*, vol. 28, pp. 127–168.

57. Chia, Y.-M. (1995) 'The Interaction Effect of Information Asymmetry and Decentralization on Managers' Job Satisfaction: A Research Note', *Human Relations*, vol. 48, no. 6, pp. 609–624.

58. Chun, M. and Mooney, J. (2009) 'CIO roles and responsibilities: Twenty-five years of evolution and change', *Information & Management*, vol. 46, no. 6, pp. 323–334.

59. Cohen, J. (1988) *Statistical power analysis for the behavioral sciences*, 2nd edn, Hillsdale, N.J., L. Erlbaum Associates.

60. Cohen, J. and Dennis, C. M. (2010) 'Chief information officers:: an empirical study of competence, organisational positioning and implications for performance', *South African Journal of Economic and Management Sciences,*, vol. 13, no. 2, pp. 203–221.

61. Cohen-Charash, Y. and Spector, P. E. (2001) 'The Role of Justice in Organizations: A Meta-Analysis', *Organizational Behavior and Human Decision Processes*, vol. 86, no. 2, pp. 278–321.

62. Coldwell, D. A. L. and Perumal, S. (2007) 'Perceptions of the Measurability, Importance and Effects of Work Equity on Job Satisfaction and Work Motivation: An Exploratory Study of the Utility of Equity Theory', *Alternation*, vol. 14, no. 1, pp. 197–217.

63. Comelli, G. (2014) *Führung durch Motivation: Mitarbeiter für die Ziele des Unternehmens gewinnen*, 5th edn, München, Franz Vahlen.

64. Conlon, E. J. and Parks, J. M. (1990) 'EFFECTS OF MONITORING AND TRADITION ON COMPENSATION ARRANGEMENTS: AN EXPERIMENT WITH PRINCIPAL-AGENT DYADS', *Academy of Management Journal*, vol. 33, no. 3, pp. 603–622.

65. Connelly, B. L., Certo, S. T., Ireland, R. D. and Reutzel, C. R. (2011) 'Signaling Theory: A Review and Assessment', *Journal of Management*, vol. 37, no. 1, pp. 39–67 [Online]. DOI: 10.1177/0149206310388419 (Accessed 4 January 2023).

66. Cortina, J. M. (1993) 'What is coefficient alpha? An examination of theory and applications', *The Journal of applied psychology*, vol. 78, no. 1, pp. 98–104.

67. Crawshaw, J. R. (2011) 'Career development, progression and trust', in Searle, R. H. and Skinner, D. (eds) *Trust and human resource management* [Online], Cheltenham, U.K,

Northampton, MA, USA, Edward Elgar, pp. 157–175. Available at https://www.elgaronline.com/view/9781848444645.xml.

68. Creswell, J. W. (2014) *Research design: Qualitative, quantitative, and mixed methods approaches*, Los Angeles, SAGE.

69. Cropanzano, R. and Wright, T. A. (2001) 'When a "happy" worker is really a "productive" worker: A review and further refinement of the happy-productive worker thesis', *Consulting Psychology Journal: Practice and Research*, vol. 53, no. 3, pp. 182–199.

70. Cross, K. F. and Lynch, R. L. (1988-1989) 'The SMART way to define and sustain success', *National Productivity Review*, vol. 8, no. 1.

71. Dadhich, P. (2022) *Top 10 priorities of CIOs in 2022* [Online]. Available at https://wire19.com/top-10-priorities-of-cios-in-2022/.

72. Damij, N., Levnajić, Z., Rejec Skrt, V. and Suklan, J. (2015) 'What Motivates Us for Work? Intricate Web of Factors beyond Money and Prestige', *PloS one*, vol. 10, no. 7, e0132641.

73. Davison, B. (2003) 'Management span of control: how wide is too wide?', *Journal of Business Strategy*, vol. 24, no. 4, pp. 22–29.

74. Deci, E. L. and Ryan, R. M. (1985) *Intrinsic Motivation and Self-Determination in Human Behavior*, Boston, MA, Springer US.

75. Demougin, D. and Fluet, C. (1997) 'Monitoring versus Incentives: Substitutes or Complements?', *Center for Research on Economic Fluctuations and Employment (CREFE), 1997.*, pp. 1–25.

76. Denzin, N. K. (1975) *The Research Act: A theorical introduction to sociological methods*, 5th edn, Chicago, IL, Aldine.

77. Dern, G. (2009) *Management von IT-Architekturen* [Online], Wiesbaden, Springer Fachmedien. Available at https://docplayer.org/658124-Gernot-dern-management-von-it-architekturen.html.

78. Dikolli, S., Hofmann, C. and Kulp, S. C. (2009) 'Interrelated Performance Measures, Interactive Effort, and Optimal Incentives', *Journal of Management Accounting Research*, vol. 21, pp. 129–149.

79. Dillman, D. A., Smyth, J. D. and Christian, L. M. (2014) *Internet, phone, mail, and mixed-mode surveys: The tailored design method*, Hoboken, Wiley.

80. Ding, F., Li, D. and George, J. F. (2014) 'Investigating the effects of IS strategic leadership on organizational benefits from the perspective of CIO strategic roles', *Information & Management*, vol. 51, no. 7, pp. 865–879.

81. Dirks, K. T. and Ferrin, D. L. (2002) 'Trust in leadership: meta-analytic findings and implications for research and practice', *The Journal of applied psychology*, vol. 87, no. 4, pp. 611–628.

82. Doheny, M., Nagali, V. and Weig, F. (2012) 'Agile operations for volatile times: Agile operations for volatile times By improving how risk is measured—and managed—in global operations, companies can adapt to changing conditions faster than competitors.', *McKinsey Quarterly*, pp. 1–7 [Online]. Available at https://www.mckinsey.com/capabilities/operations/our-insights/agile-operations-for-volatile-times.

83. Döring, N. and Bortz, J. (2016) *Forschungsmethoden und Evaluation in den Sozial- und Humanwissenschaften* [Online], 5th edn, Berlin, Heidelberg, Springer. Available at http://dx.doi.org/10.1007/978-3-642-41089-5.

84. Drucker, P. (1954) *The practice of Management*, Harper.

85. Dun & Bradstreet Deutschland *Dun&Bradstreet Firmendaten und Wirtschaftsdatenbank* [Online], Darmstadt. Available at https://www.dnb.com/de-de/lp/firmenadressen-und-wirtschaftsdaten (Accessed 16 January 2023).

86. Dunk, A. S. (1992) 'The Effect of Budget Emphasis and Information Asymmetry on the Relation between Budgetary Participation and Slack', *The Accounting Review*, vol. 68, no. 2, pp. 400–410 [Online]. Available at https://www.jstor.org/stable/248408.

87. Dunleavy, P. (2003) *Authoring a PhD: How to Plan, Draft, Write and Finish a Doctoral Thesis*, Basingstroke, Palgrave Macmillan.

88. Durst, M. (2007) *Wertorientiertes Management von IT-Architekturen*, Teubner.

89. Easterby-Smith, M., Thorpe, R. and Lowe, A. (2000) *Management research: An introduction*, London, SAGE.

90. Edmondson, A. C., Roberto, M. A. and Watkins, M. D. (2003) 'A dynamic model of top management team effectiveness: managing unstructured task streams', *The Leadership Quarterly*, vol. 14, no. 3, pp. 297–325.

91. Edwards, J. (2022) *8 top priorities for CIOs in 2022* [Online]. Available at https://www.cio.com/article/303215/8-top-priorities-for-cios-in-2022.html (Accessed 7 March 2022).

92. Efron, B. and Tibshirani, R. (1986) 'Bootstrap Methods for Standard Errors, Confidence Intervals, and Other Measures of Statistical Accuracy', *Statistical Science*, vol. 1, no. 1.

93. Efron, B. and Tibshirani, R. (1993) *An introduction to the bootstrap*, New York, Chapman and Hall.

94. Eisenhardt, K. M. (1988) 'Agency and Institutional Theory explanations: the case of Retail sales', *Academy of Management Journal*, vol. 31, no. 3, pp. 488–511.

95. Eisenhardt, K. M. (1989) 'Agency Theory: An Assessment and Review', *The Academy of Management Review*, vol. 14, no. 1, pp. 57–74.

96. Eliyana, A., Ma'arif, S. and Muzakki (2019) 'Job satisfaction and organizational commitment effect in the transformational leadership towards employee performance', *European Research on Management and Business Economics*, vol. 25, no. 3, pp. 144–150.

97. Enns, H. G., Huff, S. L. and Golden, B. R. (2001) 'How CIOs obtain peer commitment to strategic IS proposals: Barriers and facilitators', *The Journal of Strategic Information Systems*, vol. 10, no. 1, pp. 3–14.

98. Enns, H. G., Huff, S. L. and Golden, B. R. (2003) 'CIO influence behaviors: The impact of technical background', *Information & Management*, vol. 40, no. 5, pp. 467–485.

99. Ensminger, J. (2001) 'Reputations, Trust, and the Principal Agent Problem', in Cook, K. S. (ed) *Trust in society* [Online], New York, Russell Sage Foundation, pp. 185–201. Available at http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&AN=1066648.

100. European Commission *ESCO: European Skills/Competences, qualifications and Occupations* [Online]. Available at https://ec.europa.eu/esco/portal/home (Accessed 10 February 2021).

101. Feeny, D. F., Edwards, B. R. and Simpson, K. M. (1992) 'Understanding the CEO/CIO Relationship', *MIS Quarterly*, vol. 16, no. 4, pp. 119–126.

102. Field, A. P. (2018) *Discovering statistics using IBM SPSS statistics*, 5th edn, London, Thousand Oaks, California, SAGE Publications.

103. Finck, G., Timmers, J. and Mennes, M. (1998) 'Satisfaction vs. motivation.', *Across The Board*, vol. 35, no. 9, pp. 55–56.

104. Friis, I., Hansen, A. and Vámosi, T. (2015) 'On the Effectiveness of Incentive Pay: Exploring Complementarities and Substitution between Management Control System

Elements in a Manufacturing Firm', *European Accounting Review*, vol. 24, no. 2, pp. 241–276.

105. Garengo, P., Biazzo, S. and Bititci, U. S. (2005) 'Performance measurement systems in SMEs: A review for a research agenda', *International Journal of Management Reviews*, vol. 7, no. 1, pp. 25–47 [Online]. DOI: 10.1111/j.1468-2370.2005.00105.x.
106. Gartner Inc. (2022) *2022 CIO Agenda: Create an Action Plan to Master Business Composability* [Online]. Available at https://www.gartner.com/en/information-technology/insights/cio-agenda.
107. Georgakakis, D., Heyden, M. L., Oehmichen, J. D. and Ekanayake, U. I. (2019) 'Four decades of CEO–TMT interface research: A review inspired by role theory', *The Leadership Quarterly*, pp. 1–4.
108. Gerow, J. E., Grover, V., Thatcher, J. and Roth, P. L. (2014) 'Looking Toward the Future of IT-Business Strategic Alignment through the Past: A Meta-Analysis', *MIS Quarterly*, vol. 38, no. 4, pp. 1059–1085.
109. Gladen, W. (2014) *Performance Measurement: Controlling mit Kennzahlen*, 6th edn, Wiesbaden, Springer.
110. Gläser, J. and Laudel, G. (2010) *Experteninterviews und qualitative Inhaltsanalyse als Instrumente rekonstruierender Untersuchungen* [Online], 4th edn, Wiesbaden, VS Verlag. Available at http://d-nb.info/1002141753/04.
111. Gollenia, L. A. (2019) *Pioniere des Wandels: Der DAX 30 CIO Index* [Online], SpencerStuart. Available at https://www.spencerstuart.de/research-and-insight/the-dax-30-cio-index (Accessed Accessed 26 January 2023).
112. Gottschalk, P. and Taylor, N. J. (2000) 'Strategic management of IS/IT functions: The role of the CIO', *Proceedings of the 33rd Annual Hawaii International Conference on System Sciences.* Maui, HI, USA, 4-7 Jan. 2000, IEEE Comput. Soc, p. 10.
113. Grabner, I. and Moers, F. (2013) 'Management Control as a System or a Package? Conceptual and Empirical Issues', *SSRN Electronic Journal*, pp. 407–419.
114. Grant, A. M. (2008) 'Employees without a Cause: The Motivational Effects of Prosocial Impact in Public Service', *International Public Management Journal*, vol. 11, no. 1, pp. 48–66.
115. Griffin, R. W. and Moorhead, G. (2014) *Organizational behavior: Managing people and organizations*, 11th edn, Mason, OH, South-Western Cengage Learning.

116. Guillemette and Paré (2012) 'Toward a New Theory of the Contribution of the IT Function in Organizations', *MIS Quarterly*, vol. 36, no. 2, p. 529.
117. Guillemette, M. G. and Paré, G. (2012) 'Transformation of the Information Technology Function in Organizations: A Case Study in the Manufacturing Sector', *Canadian Journal of Administrative Sciences / Revue Canadienne des Sciences de l'Administration*, vol. 29, no. 2, pp. 177–190.
118. Gurbaxani, V. and Kemerer, C. F. (1990) 'An Agency Theory view of the Management of end-user computing', *Proceedings of the 11th International Conference on Information Systems (ICIS), Copenhagen*.
119. Haimann, T. and Scott, W. (1970) *Management in the Modern Organization*, Houghton Mifflin.
120. Hair, J. F. (2010) *Multivariate data analysis: A global perspective*, 7th edn, Upper Saddle River, Prentice Hall.
121. Hambrick, D. C. (2007) 'Upper Echelons Theory: An Update', *Academy of Management Review*, vol. 32, no. 2, pp. 334–343.
122. Hambrick, D. C. (2018) 'Upper Echelons Theory', in Augier, M. and Teece, D. J. (eds) *The Palgrave Encyclopedia of Strategic Management*, London, Palgrave Macmillan UK, pp. 1782–1785.
123. Hanschke, I. (2010) *Strategic IT Management*, Berlin, Heidelberg, Springer Berlin Heidelberg.
124. Harter, J. K., Schmidt, F. L. and Hayes, T. L. (2002) 'Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta-analysis', *The Journal of applied psychology*, vol. 87, no. 2, pp. 268–279.
125. Hartmann, B. (1961) *Betriebswirtschaftliche Grundlagen der automatisierten Datenverarbeitung*, Freiburg i. Br., Rudolf Haufe Verlag.
126. Hayes, A. F. (2022a) *Introduction to Mediation, Moderation, and Conditional Process Analysis, Third Edition : A Regression-Based Approach*, Guilford Publications.
127. Hayes, A. F. (2022b) *PROCESS Procedure for SPSS (*4.2) [Computer program]. Available at www.afhayes.com.
128. Heinrich, L., Riedl, R., Stelzer, D. and Sikora, H. (2014) *Informationsmanagement, 11th Edition*, 11th edn, De Gruyter Oldenbourg.
129. Herzberg, F. (1979) 'Motivation and Innovation: Who Are Workers Serving?', *California Management Review*, vol. 22, no. 2, pp. 60–70.

130. Herzberg, F., Mausner, B. and Snyderman, B. B. (2010) *The motivation to work*, 12th edn, New Brunswick, NJ, Transaction Publ.

131. Hetzel, P. *Top 7 challenges IT leaders will face in 2022* [Online], CIO.com. Available at https://www.cio.com/article/302904/top-7-challenges-it-leaders-will-face-in-2022.html (Accessed 12 December 2022).

132. Hilmarsson, S. T. and Rikhardsson, P. (2011) 'The Evolution of Motivation and Incentive Systems Research: A Literature Review', *SSRN Electronic Journal*.

133. Hinde, S. and Spackman, E. (2015) 'Bidirectional citation searching to completion: an exploration of literature searching methods', *PharmacoEconomics*, vol. 33, no. 1, pp. 5–11.

134. Hodgkinson, S. L. (1992) 'IT structures for the 1990s:: organisation of IT functions in large companies.', *Information & Management*, vol. 22, no. 3, 161-175.

135. Hofmann, J. and Schmidt, W. (2010) *Masterkurs IT-Management: Grundlagen, Umsetzung und erfolgreiche Praxis für Studenten und Praktiker*, 2nd edn, Wiesbaden, Vieweg + Teubner.

136. Holmström, B. (1979) 'Moral Hazard and Observability', *The Bell Journal of Economics*, vol. 10, no. 1, p. 74.

137. Holstrom, B. and Milgrom, P. (1991) 'Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design', *Journal of Law, Economics & Organization*, vol. 7, pp. 24–52.

138. Holtz, B. C. (2013) 'Trust Primacy: A model of the reciprocal relations between trust and perceived justice.', *Journal of Management*, vol. 39, no. 7, pp. 1891–1923.

139. Hoole, C. and Vermeulen, L. P. (2003) 'Job satisfaction among South African aircraft pilots', *SA Journal of Industrial Psychology*, vol. 29, no. 1.

140. Höpfner, R. and Bjarne Erik Roscher (2022) 'Demonstration of the Impact of Enterprise Architecture Management in a Company by Using Frameworks', in Akçaoğlu, E. (ed) *SMEs and international business: Finance, innovation, enterprise architecture and business education*, Würzburg, Istanbul, WIBP Würzburg International Business Press; Dogus University, pp. 104–119.

141. Höpfner, R. and Roscher, B. E. (2021) 'Enterprise Architecture Management: Requirements for Conception of Key Figures to Ensure Transparency and Efficiency', *Proceedings of The 4th International Conference on Advanced Research in Business, Management and Economics*, GLOBALKS.

142. Howells, J. (2022) *Eight challenges CIOs must address in 2022* [Online]. Available at https://www.orange-business.com/en/blogs/eight-challenges-cios-must-address-2022 (Accessed 9 December 2022).

143. Hulin, C. L. (1969) 'Source of Variation in Job and Life Satisfaction: The Role of Community and Job-Related Variables.', *Journal of Applied Psychology*, vol. 53, pp. 279–291.

144. Hütter, A., Arnitz, T. and Riedl, R. (2016) 'Effective CIO/CEO Communication', in Nissen, V., Stelzer, D., Straßburger, S. and Fischer, D. (eds) *Multikonferenz Wirtschaftsinformatik (MKWI) 2016: Technische Universität Ilmenau, 09. - 11. März 2016* [Online], Ilmenau, Universitätsverlag Ilmenau, pp. 1523–1534. Available at http://www.db-thueringen.de/servlets/DocumentServlet?id=27211.

145. Hütter, A., Arnitz, T. and Riedl, R. (2017) *On the Nature of Effective CIO/CEO Communication*, Cham, Springer International Publishing.

146. IBM Corp. *IBM SPSS Statistics for Windows (*22.0) [Computer program].

147. IBM Corp. *IBM SPSS Statistics for Windows (*26.0) [Computer program].

148. Info-Tech Research Group (ed) (2022) *CIO Priorities Report for 2022* [Online]. Available at https://www.infotech.com/research/cio-priorities-report-for-2022.

149. (2011) *ITIL® service design*, 2nd edn, London, TSO.

150. Jensen, M. C. and Meckling, W. H. (1976) 'Theory of the firm: Managerial behavior, agency costs and ownership structure', *Journal of Financial Economics*, vol. 3, no. 4, pp. 305–360.

151. Johanning, V. (2014) *IT-Strategie: Optimale Ausrichtung der IT an das Business in 7 Schritten*, Wiesbaden, Germany, Springer Vieweg.

152. Johanson, G. A. and Brooks, G. P. (2010) 'Initial Scale Development: Sample Size for Pilot Studies', *Educational and Psychological Measurement*, vol. 70, no. 3, pp. 394–400.

153. Johnson, A. M. and Lederer, A. L. (2006) 'The Impact of CEO/CIO Convergence on IT Strategic Alignment.', in Khosrow-Pour, M. (ed) *Emerging trends and challenges in information technology management*, Hershey, Pennsylvania (701 E. Chocolate Avenue, Hershey, Pa., 17033, USA), IGI Global, pp. 50–54.

154. Johnson, A. M. and Lederer, A. L. (2009) 'CEO/CIO Communication and the Strategic Grid Dimensions', in Tan, A. W. K. and Theodorou, P. (eds) *Strategic Information Technology and Portfolio Management*, IGI Global, pp. 206–229.

155. Johnson, A. M. and Lederer, A. L. (2010) 'CEO/CIO mutual understanding, strategic alignment, and the contribution of IS to the organization', *Information & Management*, vol. 47, no. 3, pp. 138–149.

156. Johnston, R., Brignall, S. and Fitzgerald, L. (2002) ''Good enough' performance measurement: a trade-off between activity and action', *Journal of the Operational Research Society*, vol. 53, no. 3, pp. 256–262.

157. Jones, M. C., Taylor, G. and Spencer, B. A. (1995) 'The CEO/CIO relationship revisited: An empirical assessment of satisfaction with IS', *Information & Management*, vol. 29, no. 3, pp. 123–130.

158. Jordan, E. (1993) 'Executive information systems for the chief information officer', *International Journal of Information Management*, vol. 13, no. 4, pp. 249–259.

159. Judge, T. A. and Watanabe, S. (1993) 'Another look at the job satisfaction-life satisfaction relationship', *The Journal of applied psychology*, vol. 78, no. 6, pp. 939–948.

160. Kaltiainen, J., Helkama, K. and Jasinskaja-Lahti, I. (2018) 'Trust in organizations — organizational, intergroup, and value research perspective', *Social Psychology and Society*, vol. 9, no. 1, pp. 8–21.

161. Kam, C. D. and Franzese, R. J. (2007) *Modeling and interpreting interactive hypotheses in regression analysis*, Ann Arbor, Mass., Univ. of Michigan Press.

162. Kaplan, R. S. and Norton, D. P. (2001) 'Transforming the Balanced Scorecard from Performance Measurement to Strategic Management: Part I', *Accounting Horizons*, vol. 15, no. 1, pp. 87–104.

163. Katou, A. A. (2015) 'Transformational leadership and organisational performance', *Employee Relations*, vol. 37, no. 3, pp. 329–353.

164. Keegan, W. J. (1989) *Global marketing management*, 4th edn, Englewood Cliffs, NJ, Prentice Hall.

165. Kellough, J. E. and Lu Haoran (1993) 'The paradox of merit pay in the public sector: Persitence of a problematic procedure', *Review of Public Personnel Administration*, vol. 13, no. 2, pp. 45–64.

166. Kempis, R.-D. and Ringbeck, J. (1998) *Do it smart: Chefsache Informationstechnologie; Auf de Suche nach Effektivität*, Wien, Ueberreuter.

167. Kestler, K. and Wehrhagen, M. (2016) *Zufriedene Mitarbeiter betrügen nicht: Investieren Sie in Mitarbeiter und nicht in Überwachung*, 2nd edn, Berlin, epubli GmbH.

168. Kim, S. and Min Park, S. (2014) 'Determinants of job satisfaction and turnover intentions of public employees: evidence from US federal agencies', *International Review of Public Administration*, vol. 19, no. 1, pp. 63–90.

169. Kleindienst, B. (2017) *Performance Measurement und Management* [Online], Springer Fachmedien Wiesbaden.

170. Kleinhenz, S. (2015) *Dialogisches Management Zur Steigerung der Mitarbeiterzufriedenheit: Personal- und Organisationsentwicklung Für Führungskräfte*, Wiesbaden, Springer.

171. Knop, K. and Mielczarek, K. (2015) 'The improvement on the basis of PDCA and SDCA cycles', *Zeszyty Naukowe. Quality. Production. Improvement*, vol. 2, no. 3, pp. 60–71.

172. Kohn, A. (1993) 'Alfie Kohn responds', *Harward Business Review*, vol. 71, no. 6, pp. 48–49 [Online]. Available at https://hbr.org/1993/09/why-incentive-plans-cannot-work (Accessed 29 February 2024).

173. Korhonen, J. J. (2015) 'The Changing Role of the CIO', in Collin, J., Korhonen, J. J., Halén, M. and Itälä, Timo, Helenius, Mika (eds) *IT Leadership in Transition: The Impact of Digitalization on Finnish Organizations*, Helsinki, Aalto University publishing series, pp. 58–66.

174. Koskela, L., Tezel, A. and Patel, V. (2019) 'Theory of Quality Management: Its Origins and History', *Proc. 27th Annual Conference of the International Group for Lean Construction (IGLC).* Dublin, Ireland, 03.07.2019 - 05.07.2019, International Group for Lean Construction, pp. 1381–1390.

175. Kraus, R. and Kreitenweis, T. (eds) (2020) *Führung messen*, Berlin, Heidelberg, Springer Berlin Heidelberg.

176. Krcmar, H. (1991) 'Integration in der Wirtschaftsinformatik - Aspekte und Tendenzen.', in *Integrierte Informationssysteme*, Wiesbaden, Gabler Verlag, p. 190.

177. Krcmar, H. (2015) *Informationsmanagement*, 6th edn, Berlin, Heidelberg, Springer Gabler.

178. Kueng, P. and Wettstein, T. (2001) *Gesamtheitliches Performance Measurement — Vorgehensmodell und informationstechnische Ausgestaltung* [Online], Vieweg+Teubner Verlag.

179. La Paz, A., Lobos, C. and Lopez, D. (2018) 'CIO Performance Measurement', *International Conference on Information Resources Management (CONF-IRM 2018) Proceedings*, p. 12 [Online]. Available at http://aisel.aisnet.org/confirm2018/12 (Accessed 11 December 2022).

180. Lahmann, J. (2023) *Das motivierte Unternehmen: Tools und Techniken für ein leistungsstarkes Team*, Weinheim, Wiley-VCH GmbH.

181. Lather, A. S. and Jain, S. (2005) 'MOTIVATION AND JOB SATISFACTION: A STUDY OF ASSOCIATES OF PUBLIC AND PRIVATE SECTOR', *Delhi Business Review*, vol. 6, no. 1, pp. 77–84.

182. Lawler, E. E. and Porter, L. W. (1967) 'Antecedent attitudes of effective managerial performance', *Organizational Behavior and Human Performance*, vol. 2, no. 2, pp. 122–142.

183. Lebas, M. J. (1995) 'Performance measurement and performance management', *International Journal of Production Economics*, vol. 41, 1-3, pp. 23–35.

184. Lee, J., Elbashir, M. Z., Mahama, H. and Sutton, S. G. (2014) 'Enablers of top management team support for integrated management control systems innovations', *International Journal of Accounting Information Systems*, vol. 15, no. 1, pp. 1–25.

185. Leiner, D. J. (2019) *SoSci Survey (*3.1.06) [Computer program]. Available at www.soscisurvey.de.

186. Li, Y. and Tan, C.-H. (2013) 'Matching business strategy and CIO characteristics: The impact on organizational performance', *Journal of Business Research*, vol. 66, no. 2, pp. 248–259.

187. Li, Y., Tan, C.-H., Teo, H.-H. and Tan, B. (2006) 'Innovative usage of information technology in Singapore organizations: Do CIO characteristics make a difference?', *IEEE Transactions on Engineering Management*, vol. 53, no. 2, pp. 177–190.

188. Ling, Y., Wei, L., Klimoski, R. J. and Wu, L. (2015) 'Benefiting from CEO's empowerment of TMTs: Does CEO–TMT dissimilarity matter?', *The Leadership Quarterly*, vol. 26, no. 6, pp. 1066–1079.

189. Locke, E. A. (1969) 'What is Job Satisfaction?', *Organizatioal Behaviour and Human Performance*, no. 4, pp. 309–336.

190. Locke, E. A. (1976) 'The nature and causes of job satisfaction', in Dunnette, M. D. (ed) *Handbook of industrial and organizational psychology*, Chicago, IL, Rand McNally.

191. Locke, E. A. and Latham, G. P. (1990a) *A theory of goal setting & task performance*, Prentice-Hall.

192. Locke, E. A. and Latham, G. P. (1990b) 'Work Motivation and Satisfaction: Light at the End of the Tunnel', *Psychological Science*, vol. 1, no. 4, pp. 240–246.

193. Longenecker, C. O. (1997) 'Why managerial performance appraisals are ineffective: causes and lessons', *Career Development International*, vol. 2, no. 5, pp. 212–218.

194. Lorincová, S., Hitka, M., Szabó, P. and Javorciková, J. (2016) 'Motivation Factors Influencing Senior Managers in the Forestry and Wood-Processing Sector in Slovakia', *BioResources Journal*, vol. 11, no. 4.

195. Luftman, J. and Brier, T. (1999) 'Achieving and Sustaining Business-IT Alignment', *California Management Review*, vol. 42, no. 1, pp. 109–122.

196. Luftman, J., Zadeh, H. S., Derksen, B., Santana, M., Rigoni, E. H. and Huang, Z. (2013) 'Key Information Technology and Management Issues 2012-2013: An International Study', *Journal of Information Technology*, vol. 28, no. 4, pp. 354–366.

197. MacCallum, R. C. and Browne, M. W. (1993) 'The use of causal indicators in covariance structure models: some practical issues', *Psychological bulletin*, vol. 114, no. 3, pp. 533–541.

198. Marrone, M. and Kolbe, L. M. (2011) 'Impact of IT Service Management Frameworks on the IT Organization', *Business & Information Systems Engineering*, vol. 3, no. 1, pp. 5–18.

199. Martinez Aguilar, J. A. (2022) *Top Three Challenges Facing CIOs In 2023* [Online]. Available at https://www.forbes.com/sites/forbestechcouncil/2022/11/01/top-three-challenges-facing-cios-in-2023/?sh=70d9718f7f90 (Accessed 9 December 2022).

200. Mas-Colell, A., Whinston, M. D. and Green, J. R. (2011) *Microeconomic theory*, New York, NY u.a., Oxford Univ. Press.

201. Maslow, A. H. (1943) 'A theory of human motivation', *Psychological Review*, vol. 50, no. 4, pp. 370–396.

202. Mathur, A., Dangayach, G. S., Mittal, M. L. and Sharma, M. K. (2011) 'Performance measurement in automated manufacturing', *Measuring Business Excellence*, vol. 15, no. 1, pp. 77–91 [Online]. DOI: 10.1108/13683041111113268.

203. Matzler, K. and Renzl, B. (2006) 'The Relationship between Interpersonal Trust, Employee Satisfaction, and Employee Loyalty', *Total Quality Management & Business Excellence*, vol. 17, no. 10, pp. 1261–1271 [Online]. DOI: 10.1080/14783360600753653.

204. Mayer, R. C. and Gavin, M. B. (2005) 'Trust in Management and Performance: Who Minds the Shop while the Employees Watch the Boss?', *Academy of Management Journal*, vol. 48, no. 5, pp. 874–888.

205. Maylor, H. (2017) *Researching business and management*, 2nd edn, Oxford, Macmillan Education.

206. Megginson, L. C., Mosley, D. C. and Pietri, P. H. (1991) *Management: Concepts and applications*, 4th edn, New York, NY, Harper Collins.

207. Mertens, P. and Knolmayer, G. (1995) *Organisation der Informationsverarbeitung: Grundlagen, Aufbau, Arbeitsteilung*, 2nd edn, Wiesbaden, Gabler.

208. Miller, G. J. and Whitford, A. B. (2002) 'Trust and Incentives in Principal-Agent Negotiations: The 'Insurance/Incentive Trade-Off'', *Journal of Theoretical Politics*, vol. 14, no. 2, pp. 231–267.

209. Miloševic, D. and Srivannaboon, S. (2006) 'A theoretical framework for aligning project management with business strategy'.

210. Minciu, M., Berar, F.-A. and Dobrea, R. C. (2020) 'New decision systems in the VUCA world', *Management & Marketing. Challenges for the Knowledge Society*, vol. 15, no. 2, pp. 236–254.

211. Mishra, A. K. (1996) 'Organizational Responses to Crisis: The Centrality of Trust', *SAGE Publications, Inc.*,

212. Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P. and Stewart, L. A. (2015) 'Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement', *Systematic reviews*, vol. 4, no. 1, pp. 1–9.

213. Moore, J. (2022) *Top 7 CIO challenges in 2022* [Online]. Available at https://www.techtarget.com/searchcio/tip/Top-7-CIO-challenges-and-how-to-handle-them (Accessed 9 December 2022).

214. Neely, A., Gregory, M. and Platts, K. (1995) 'Performance measurement system design', *International Journal of Operations & Production Management*, vol. 15, no. 4, pp. 80–116 [Online]. DOI: 10.1108/01443579510083622.

215. Neničková, H. (2011) 'Critical Success Factors for ITIL Best Practices usage', *Economics & Management*, vol. 16, pp. 839–844.

216. Nissen, V. and Termer, F. (2014) 'Business-IT-Alignment: Ergebnisse einer Befragung von IT-Führungskräften in Deutschland', *HMD Praxis der Wirtschaftsinformatik*, vol. 51, no. 5, pp. 549–560.

217. Omar, M. S., Mohd Idrus, I. and Jamal, N. A. (2021) 'The Influence of Job Motivation on Job Satisfaction: A Case Study of Polytechnic Academic Staff', *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, vol. 6, no. 1, pp. 206–213.

218. Organ, D. W. (1988) *Organizational citizenship behavior: The good soldier syndrome*, Lexington, Mass., Lexington Books.

219. Ossola-Haring, C., Schlageter, A. and Schöning, S. (2016) *11 Irrtümer über Kennzahlen* [Online], Springer Fachmedien Wiesbaden.

220. Ötken, A. B. and Cenkci, T. (2012) 'The Impact of Paternalistic Leadership on Ethical Climate: The Moderating Role of Trust in Leader', *Journal of Business Ethics*, vol. 108, no. 4, pp. 525–536.

221. Pandey, P. and Asthana, P. K. (2017) 'AN EMPIRICAL STUDY OF FACTORS INFLUENCING JOB SATISFACTION', *Indian Journal of Commerce & Management Studies*, VIII, no. 3, pp. 96–105.

222. Paré, G., Guillemette, M. G. and Raymond, L. (2020) 'IT centrality, IT management model, and contribution of the IT function to organizational performance: A study in Canadian hospitals', *Information & Management*, vol. 57, no. 3, pp. 1–13.

223. Park, S. M. (2010) 'The Effects of Personnel Reform Systems on Georgia State Employees' Attitudes', *Public Management Review*, vol. 12, no. 3, pp. 403–437.

224. Pek, J., Wong, O. and Wong, A. C. M. (2018) 'How to Address Non-normality: A Taxonomy of Approaches, Reviewed, and Illustrated', *Frontiers in psychology*, vol. 9, p. 2104 [Online]. DOI: 10.3389/fpsyg.2018.02104 (Accessed 29 February 2024).

225. Peppard, J. (2010) 'Unlocking the Performance of the Chief Information Officer (CIO)', *California Management Review*, vol. 52, no. 4, pp. 73–99.

226. Perry, J. L., Brudney, J. L., Coursey, D. and Littlepage, L. (2008) 'What Drives Morally Committed Citizens? A Study of the Antecedents of Public Service Motivation', *Public Administration Review*, vol. 68, no. 3, pp. 445–458.

227. Pinder, C. C. (2014) *Work Motivation in Organizational Behavior*, 2nd edn, New York, Psychology Press.

228. Pocock, S. J., Assmann, S. E., Enos, L. E. and Kasten, L. E. (2002) 'Subgroup analysis, covariate adjustment and baseline comparisons in clinical trial reporting: Current practice and problems', *Statistics in medicine*, vol. 21, no. 19, pp. 2917–2930.

229. Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H. and Fetter, R. (1990) 'Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors', *The Leadership Quarterly*, vol. 1, no. 2, pp. 107–142.

230. Porter, M. E. (1985) *Competitive advantage*, New York, Free Press.

231. Pratt, J. W. and Zeckhauser, R. (1985) 'Principals and Agents: The Structure of Business', *Harward Business School Press*.

232. Premeaux, S. F. and Bedeian, A. G. (2003) 'Breaking the Silence: The Moderating Effects of Self-Monitoring in Predicting Speaking Up in the Workplace*', *Journal of Management Studies*, vol. 40, no. 6, pp. 1537–1562.

233. Prentice, W. C. H. (2004) 'Understanding Leadership', *Harward Business Review*, January.

234. Preston, D. S. (2003) 'Shared Mental Models Between the CIO and CEO: Towards Information Systems Strategic Alignment.', *Proceedings of 9th Americas Conference on Information Systems, AMCIS 2003, Tampa, FL, USA*, pp. 3375–3381.

235. Preston, D. S., Chen, D. and Leidner, D. E. (2008) 'Examining the Antecedents and Consequences of CIO Strategic Decision-Making Authority: An Empirical Study*', *Decision Sciences*, vol. 39, no. 4, pp. 605–642.

236. Preston, D. S. and Karahanna, E. (2009) 'Antecedents of IS Strategic Alignment: A Nomological Network', *Information systems research*, vol. 20, no. 2, pp. 159–179.

237. Preston, D. S., Karahanna, E. and Rowe, F. (2006) 'Development of shared understanding between the Chief Information officer and top management team in U.S. and French Organizations: A cross-cultural comparison', *IEEE Transactions on Engineering Management*, vol. 53, no. 2, pp. 191–206.

238. Pugh, D. S. and Hickson, D. J. (1997) *Writers on organizations* [Online], 5th edn, Thousand Oaks, Calif., SAGE Publications. Available at http://www.loc.gov/catdir/enhancements/fy0704/96025180-d.html.

239. Punch, K. F. (2011) *Introduction to social research: Quantitative and qualitative approaches*, Los Angeles, London, Washington DC, SAGE.

240. Puusa, A. and Tolvanen, U. (2006) 'Organizational Identity and Trust', *Electronic Journal of Business Ethics and Organisational Studies*, vol. 11, no. 2, pp. 29–33.

241. Rahman, M. H., Fatema, M. R. and Ali, M. H. (2019) 'Impact of Motivation and Job Satisfaction on Employee's Performance: An Empirical Study', *Asian Journal of Economics, Business and Accounting*, pp. 1–10.

242. Rainey, H. G. and Steinbauer, P. (1999) 'Galloping Elephants: Developing Elements of a Theory of Effective Government Organizations', *Journal of Public Administration Research and Theory*, vol. 9, no. 1, pp. 1–32.

243. Rammstedt, B., Kemper, C. J., Klein, M. C., Beierlein, C. and Kovaleva, A. (2013) 'Eine kurze Skala zur Messung der fünf Dimensionen der Persönlichkeit', *methoden, daten, analysen*, vol. 7, no. 2, pp. 233–249.

244. Ravarini, A., Moro, J., Tagliavini, M. and Guimaraes, T. (2001) 'Exploring the impact of CIO competencies on company performance.', *International Conference on Information Resources Management Association. Proceeding Canada*.

245. Reinheimer, S. and Robra-Bissantz, S. (2014) 'Business-IT-Alignment – Kernaufgabe der Wirtschaftsinformatik', *HMD Praxis der Wirtschaftsinformatik*, vol. 51, no. 5, pp. 526–548.

246. Ricciardi, F., Zardini, A. and Rossignoli, C. (2018) 'Organizational integration of the IT function: A key enabler of firm capabilities and performance', *Journal of Innovation & Knowledge*, vol. 3, no. 3, pp. 93–107.

247. Richardson, V. J., Sanchez, J. M., Setia, P. and Smith, R. (2018) 'Determinants and consequences of chief information officer equity incentives', *International Journal of Accounting Information Systems*, vol. 31, no. 4, pp. 37–57.

248. Richert, J. (2006) *Performance measurement in supply chains: Balanced scorecard in Wertschöpfungsnetzwerken*, Wiesbaden, Gabler.

249. Riggio, R. E. (2016) *Introduction to industrial/organizational psychology*, 6th edn, London, Routledge.

250. Risambessy, A., Swasto, B., Thoyib, A. and Astuti, E. S. (2012) 'The Influence of Transformational Leadership Style, Motivation, Burnout towards Job Satisfaction and Employee Performance', *Journal of Basic and Applied*, vol. 2, no. 9, pp. 8833–8842.

251. Roscher, B. E. (2020a) 'Formal Training of IT Managers in Germany: Research-Based On Job Advertisements', *Proceedings of The 2nd International Conference on Research in Business, Management and Finance*.

252. Roscher, B. E. (2020b) 'Job title as an indicator for strategic orientation of the IT Organization?', *Proceedings of The 11th International Conference on Modern Research in Management, Economics and Accounting MEACONF, Oxford, 18.-20.12.2020,*

253. Roscher, B. E. (2021a) 'CIO Competences and Skills: Comparison of Empirical Findings with Alternative Frameworks', *Proceedings of IAC 2021 Budapest*, pp. 34–43.

254. Roscher, B. E. (2021b) 'Two decades of CIO effectiveness research in the light of the principal-agent-theory: suggestions for future research', *Proceedings of the 13th international scientific conference "New Challenges in Economic and Business Development"*, pp. 354–361.

255. Roscher, B. E. (2021c) 'Understanding the theoretical foundations of CIO impact on organisatioal effectiveness: prior and planned research', in *Proceedings of the 15th CER Comparative European Research Conference: International Scientific Conference for Ph.D. Students of EU Countries*, London, Sciemcee Publishing, pp. 44–48.

256. Roscher, B. E. and Balina, S. (2023) 'Factors Influencing Work-Related Attitudes of Top Managers: An Expert Perspective', *Rural Sustainability Research*, no. 50, pp. 31–43.

257. Roscher, B. E. and Brink, N. (2020) 'Tasks of IT Managers: Empirical Research Based on Job Advertisements in Germany', *3rd International Conference on Applied Research in Management, Economics and Accounting. IARMEA Paris 2020*, pp. 13–18.

258. Roscher, B. E. and Nissen, V. (2021) 'The Influence of Demographic Variables on Empirical Studies Concerning Cio Gender', *Humanities and Social Sciences: Latvia*, vol. 29, no. 2, pp. 52–64.

259. Ross, J. W. and Feeny, D. F. (1999) 'The evolving role of the CIO', *Massachusetts Institute of Technology*, CISR WP No. 308, pp. 1–22.

260. Saleh, A. and Bista, K. (2017) 'Examining Factors Impactin Online Survey Response Rates in Educational Research: Perceptions of Graduate Students', *Journal of Multi Disciplinary Evaluation JMDE*, vol. 13, no. 29, pp. 63–74.

261. Samuels, M. (2021) *CIO priorities: 10 challenges to tackle in 2022* [Online]. Available at https://www.zdnet.com/article/cio-priorities-10-challenges-to-tackle-in-2022/ (Accessed 9 December 2022).

262. Schanz, M. (2010) *Experten-Karrierepfade für Ingenieure* [Online]. Available at https://www.vde.com/resource/blob/2020330/28e7de1e0154e190a8b02f5bbea690ff/experten-karrierepfade-fur-ingenieure---download-data.pdf.

263. Schoorman, F. D., Mayer, R. C. and Davis, J. H. (2007) 'An Integrative Model of Organizational Trust: Past, Present, and Future', *The Academy of Management Review*, vol. 32, no. 2, pp. 344–354.

264. Schultz, D. P. and Schultz, S. E. (1998) *Psychology and work today: An introduction to industrial and organizational psychology*, 7th edn, Upper Saddle River, New Jersey, Prentice Hall.

265. Schweda, C. M. and Schmidt, W. (2014) 'Leichtgewichtiges, unternehmensspezifisches IT-Management', *HMD - Praxis der Wirtschaftsinformatik*, vol. 51, no. 5, pp. 606–615.

266. Sekhar, C., Patwardhan, M. and Singh, R. K. (2013) 'A literature review on motivation', *Global Business Perspectives*, vol. 1, no. 4, pp. 471–487.

267. Sempane, M. E., Rieger, H. S. and Roodt, G. (2002) 'Job Satisfaction In Relation To Organisational Culture', *SA Journal of Industrial Psychology*, vol. 28, no. 2, pp. 23–30.

268. Shepard, C. J. (2022) *Top 10 Challenges CIO of Today's Transformed Organization Face* [Online]. Available at https://mudassiriqbal.net/10-cio-challenges-every-information-officer-should-know/ (Accessed 9 December 2022).

269. Shet, S. V. (2024) 'A VUCA-ready workforce: exploring employee competencies and learning and development implications', *Personnel Review*.

270. Shikdar, A. A. and Das, B. (2003) 'A strategy for improving worker satisfaction and job attitudes in a repetitive industrial task: application of production standards and performance feedback', *Ergonomics*, vol. 46, no. 5, pp. 466–481.

271. Siemens Healthineers (n. y.) *Key Experts* [Online]. Available at https://www.siemens-healthineers.com/at/careers/key-experts.

272. Simmel, G. (2016) *Soziologie: Untersuchungen über die Formen der Vergesellschaftung*, 8th edn, Frankfurt am Main, Suhrkamp.

273. Smaltz, D. H., Sambamurthy, V. and Agarwal, R. (2006) 'The antecedents of CIO role effectiveness in Organizations: An empirical study in the healthcare sector', *IEEE Transactions on Engineering Management*, vol. 53, no. 2, pp. 207–222.

274. Smith, F. J., Scott, K. D. and Hulin, C. L. (1977) 'Research Notes: Research Notes. Trends in Job-Related Attitudes of Managerial and Professional Employees', *Academy of Management Journal*, vol. 20, no. 3, pp. 454–460.

275. Sobol, M. G. and Klein, G. (2009) 'Relation of CIO background, IT infrastructure, and economic performance', *Information & Management*, vol. 46, no. 5, pp. 271–278.

276. Stephens, C. S., Ledbetter, W. N., Mitra, A. and Ford, F. N. (1992) 'Executive or Functional Manager?: The Nature of the CIO's Job', *MIS Quarterly*, vol. 16, no. 4, p. 449.

277. Stern, M. J. and Coleman, K. J. (2014) 'The Multidimensionality of Trust: Applications in Collaborative Natural Resource Management', *Society & Natural Resources*, vol. 28, no. 2, pp. 117–132.

278. Stiglitz, J. E. (2002) 'Information and the Change in the Paradigm in Economics', *American Economic Review*, vol. 92, no. 3, pp. 460–501.

279. Stolk, A., Verhagen, L. and Toni, I. (2016) 'Conceptual Alignment: How Brains Achieve Mutual Understanding', *Trends in cognitive sciences*, vol. 20, no. 3, pp. 180–191.

280. Synnott, W. R. and Gruber, W. H. (1981) *Information resource management: Opportunities and strategies for the 1980s*, New York, Wiley.

281. Sypniewska, B. A. (2014) 'Evaluation of Factors Influencing Job Satisfaction', *Contemporary Economics*, vol. 8, no. 1, pp. 57–72.

282. Szyperski, N. and Winand, U. (1989) 'Informationsmanagement und informationstechnische Perspektiven', in Bleicher, K., Seidel, E. and Wagner, D. (eds) *Organisation: Evolutionäre Interdependenzen von Kultur und Struktur der Unternehmung : Knut Bleicher zum 60. Geburtstag*, Wiesbaden, Gabler, pp. 133–150.

283. Tagliavini, M., Moro, J., Ravarini, A. M. and Guimaraes, T. (2003) 'Shaping CIO's competencies and activities to improve company performance: an empirical study.', *Proceedings of the 11th European Conference on Information Systems, ECIS 2003, Naples, Italy 16-21 June 2003*.

284. Tallon, P. P. (2014) 'A Process-Oriented Perspective on the Alignment of Information Technology and Business Strategy', *Journal of Management Information Systems*, vol. 24, no. 3, pp. 227–268.

285. Tannady, H., Andry, J. F., Gunawan, F. and Mayseleste, J. (2020) 'Enterprise Architecture Artifacts Enablers for IT Strategy and Business Alignment in Forwarding Services', *International Journal of Advanced Trends in Computer Science and Engineering*, vol. 9, no. 2, pp. 1465–1472.

286. Tanvir Alam, S. M. (2012) 'Factors Affecting Job Satisfaction, Motivation and Turnover Rate of Medical Promotion Officer (MPO) in Pharmaceutical Industry: A Study Based in Khulna City', *Asian Business Review*,, vol. 1, no. 1, pp. 126–131.

287. Tashakkori, A. and Creswell, J. W. (2007) 'Editorial: The New Era of Mixed Methods', *Journal of Mixed Methods Research*, vol. 1, no. 1, pp. 3–7.

288. Taylor, J. and Vithayathil, J. (2018) 'Who delivers the bigger bang for the buck: CMO or CIO?', *The Journal of Strategic Information Systems*, vol. 27, no. 3, pp. 207–220.

289. Teck Hong, T. and Waheed, A. (2011) 'Herzberg's motivation-hygiene theory and job satisfaction in the Malaysian retail sector: the mediating effect of love of money', *Asian Academy of Management Journal*, vol. 16, no. 1, pp. 72–94.

290. Teddlie, C. and Tashakkori, A. (2008) *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*, Thousand Oaks, SAGE.

291. Termer, F. (2015) *Determinanten der IT-Agilität: Theoretische Konzeption, empirische Analyse und Implikationen*, Springer Gabler.

292. Termer, F. and Nissen, V. (2013) *Eine Bestandsaufnahme zum IT-Management in Deutschland: Ergebnisse einer Befragung unter CIOs*, Arbeitsbericht Nr. 2013-03.

293. The RITZ-CARLTON leadership center (2019) *The Power of Empowerment* [Online]. Available at https://ritzcarltonleadershipcenter.com/2019/03/19/the-power-of-empowerment/.

294. Thesmann, S. and Burkard, W. (2015) *Wirtschaftsinformatik für Dummies* [Online], s.l., Wiley-VCH. Available at http://gbv.eblib.com/patron/FullRecord.aspx?p=1969244.

295. Tietjen, M. A. and Myers, R. M. (1998) 'Motivation and job satisfaction', *Management Decision*, vol. 36, no. 4, pp. 226–231.

296. Tosi, H. L., Locke, E. A. and Latham, G. P. (1991) 'A Theory of Goal Setting and Task Performance', *The Academy of Management Review*, vol. 16, no. 2, pp. 480–483.

297. Trefler, A. (2022) *The major challenges CIOs face in 2022 and beyond* [Online]. Available at https://www.linkedin.com/pulse/major-challenges-cios-face-2022-beyond-alan-trefler/?trk=articles_directory (Accessed 9 December 2022).

298. Tung-Liang Chen, M. and Yi Huang, T.-H. S. (2012) 'Work Motivation, Work Stress, and Job Satisfaction in between Taiwan and China: An Empitical Study', *International Journal of Psychological and Behavioral Sciences*, vol. 6, no. 8, pp. 2256–2260 [Online]. Available at scholar.waset.org/1307-6892/6617 (Accessed 7 January 2023).

299. Urbach, N. and Ahlemann, F. (2016) 'Kein Business ohne IT - IT der zentrale und unversichtbare Treiber unternehmerischer Wertschöpfung', in Urbach, N. and Ahlemann, F. (eds) *IT-Management im Zeitalter der Digitalisierung: Auf dem Weg zur*

IT-Organisation der Zukunft [Online], Berlin, Heidelberg, Springer Gabler, pp. 35–53. Available at http://dx.doi.org/10.1007/978-3-662-52832-7.

300. van Fleet, D. D. (1983) 'Span of Management Research and Issues', *Academy of Management Journal*, vol. 26, no. 3, pp. 546–552.
301. van Fleet, D. D. and Bedeian, A. G. (1977) 'A History of the Span of Management', *The Academy of Management Review*, vol. 2, no. 3, pp. 356–372.
302. Vanneste, B. S., Puranam, P. and Kretschmer, T. (2014) 'Trust over time in exchange relationships: Meta-analysis and theory', *Strategic Management Journal*, vol. 35, no. 12, pp. 1891–1902 [Online]. DOI: 10.1002/smj.2198 (Accessed 18 February 2022).
303. Venkatraman, N., Henderson, J. C. and Oldach, S. (1993) 'Continuous strategic alignment: Exploiting information technology capabilities for competitive success', *European Management Journal*, vol. 11, no. 2, pp. 139–149.
304. Vinokur-Kaplan, D., Jayaratne, S. and Chess, W. A. (1994) 'Job satisfaction and retention of social workers in public agencies, non-profit agencies, and private practice: the impact of workplace conditions and motivators', *Administration in social work*, vol. 18, no. 3, pp. 93–121.
305. Vogel-Heuser, B. and Bengler, K. (2023) 'Von Industrie 4.0 zu Industrie 5.0 – Idee, Konzept und Wahrnehmung', *HMD Praxis der Wirtschaftsinformatik*, vol. 60, no. 6, pp. 1124–1142.
306. Vroom, V. (1964) *Work and Motivation*, New York, Wiley.
307. Walchshofer, M. and Riedl, R. (2017) 'Der Chief Digital Officer (CDO): Eine empirische Untersuchung', *HMD Praxis der Wirtschaftsinformatik*, vol. 54, no. 3, pp. 324–337.
308. Ward, J. and Peppard, J. (2002) *Strategic planning for information systems by Joe Ward & Joe Peppard*, 3rd edn, John Wiley & Sons.
309. Weber, J. (1998) *Einführung in das Controlling*, 7th edn, Stuttgart, Schäffer-Poeschel.
310. Werbel, J. D. and Lopes Henriques, P. (2009) 'Different views of trust and relational leadership: Supervisor and subordinate perspectives', *Journal of Managerial Psychology*, vol. 24, no. 8, pp. 780–796.
311. Whitener, E. M., Brodt, S. E., Korsgaard, M. A. and Werner Jon M. (1998) 'Managers as initiators of trust: An exchange relationship framework for understanding managerial trustworthy behaviour', *Academy of Management Review*, vol. 23, no. 3, pp. 513–530.

312. Whitler, K. A., Boyd, D. E. and Morgan, N. A. (2017) 'The criticality of CMO-CIO alignment', *Business Horizons*, vol. 60, no. 3, pp. 313–324.

313. Wilcox, M. D. (2000) 'A Crash Diet for Dot-coms', *Kiplinger's Personal Finance Magazine*, vol. 54, no. 8, pp. 20–22.

314. Wiley, C. (1997) 'What motivates employees according to over 40 years of motivation surveys', *International Journal of Manpower*, vol. 18, no. 3, pp. 263–280.

315. Wollnik, M. (1988) 'Ein Referenzmodell des Informationsmanagements', *Information Management*, vol. 3, no. 3, pp. 34–43.

316. Wong, Y.-T., Ngo, H.-Y. and Wong, C.-S. (2006) 'Perceived organizational justice, trust, and OCB: A study of Chinese workers in joint ventures and state-owned enterprises', *Journal of World Business*, vol. 41, no. 4, pp. 344–355.

317. Yang, J. and Mossholder, K. W. (2010) 'Examining the effects of trust in leaders: A bases-and-foci approach', *The Leadership Quarterly*, vol. 21, no. 1, pp. 50–63.

318. Yayla, A. A. and Hu, Q. (2012) 'The impact of IT-business strategic alignment on firm performance in a developing country setting: exploring moderating roles of environmental uncertainty and strategic orientation', *European Journal of Information Systems*, vol. 21, no. 4, pp. 373–387.

319. Zeffane, R. and Melhem, S. B. (2018) 'Do feelings of trust/distrust affect employees' turnover intentions? An exploratory study in the United Arab Emirates', *Middle East J. of Management*, vol. 5, no. 4, pp. 385–408.

320. Zimmermann, S. and Rentrop, C. (2012) 'Schatten-IT', *HMD Praxis der Wirtschaftsinformatik*, vol. 49, no. 6, pp. 60–68.

APPENDIX

Appendix A: Sources for literature analysis

Appendix A illustrates the academic sources used for the literature analysis performed in Chapter 1 of this work. To ensure a transparent research process, the authors, the title, the type of source, the research method, the year and where available the keywords used in the publication have been indicated in the following table. The full reference of the papers is only included in the bibliography if it was used actively. The references can be found in the respective sections of this thesis.

No.	Autor	Title	Type of source	Research method	Year of publication	Keywords*
Career Development						
1	(Babin & Grant 2019)	How Do CIOs Become CEOs?	Journal	Case based qualitative model, Literature review	2019	Career Opportunities, Case Studies, IT Leadership, Leadership
2	(Gottschalk 2007)	The Changing Role of CIO to CEO	Book		2007	Not available
3	(Jones 2012)	CIO to CEO: A difficult transition?	Journal	Viewpoint	2012	Not available
4	(Jones et al. 2019)	Pathways to being CIO: The role of background revisited	Journal		2019	CIO background, CIO business focus, CIO C-suite access, CIO C-level access, CIO roles, Executive Management, Reporting line, Reporting relationship
5	(Couger & Amoroso 1989)	Elevating the top IS position to CIO	Conference	Survey	1989	Not available
CIO Background, Traits, Skills, Competences, Roles and Responsibilities						
6	(Gerth & Peppard 2016)	The dynamics of CIO derailment: How CIOs come undone and how to avoid it	Journal	Summary of research based on interviews and surveys over a timeframe of 8 years	2016	Executive derailment; CIO turnover; CIO success; Digital leadership; Digital transformation
7	(Li et al. 2021)	The strategic role of CIOs in IT controls: IT control weaknesses and CIO turnover	Journal	Quantitative based on secondary data	2021	Sarbanes-Oxley, Internal controls, Information technology control weaknesses, Remediation, CIO turnover
8	(Abolhassan 2005)	From CIO to Chief Process Officer	Book		2005	Not available
9	(Chatterjee et al. 2018)	The Effect of CIO Virtues on CIO Role Effectiveness	Conference	Quantitative primary and secondary data and matched pair interview	2012	Not available
10	(Chen & Preston 2007)	Understanding CIO Role Effectiveness:	Conference	Quantitative matched pair survey	2007	Not available
11	(Chun & Mooney 2009)	CIO roles and responsibilities: Twenty-five years of evolution and change	Journal	Exploratory multiple-case study, secondary data and Interviews	2009	Information systems management, Executive roles and responsibilities, Innovation, Technology
12	(Enns, Huff & Golden 2003)	CIO influence behaviors: The impact of technical background	Journal	Focused Interviews	2003	Influence behaviors; Technical backgrounds; Strategic information systems; Socialization; Modified theory of vocational choice
13	(Feng & Wang 2019)	Does CIO risk appetite matter?: Evidence from	Journal	Secondary data	2019	Information security risk management, Information security breach

		information security breach incidents				
14	(Gerth & Peppard 2020b)	Taking the Reins as CIO	Book		2020	Not available
15	(Gonzalez, Ashworth & McKeen 2019)	The CIO stereotype: Content, bias, and impact	Journal	Survey	2019	CIO stereotype, IT stereotype, IS leadership, Strategic leadership role
16	(Gouveia & Varajão 2019)	CIOCB: A framework of competences for the Chief Information	Conference	Interviews	2019	role, profile, competence, baseline, framework.
17	(Hillebrand & Westner 2021)	Success factors of long-term CIOs	Journal	Interviews	2022	CIO tenure, Critical success factors, CIO roles, Interview-based exploratory mixed-method study
18	(Kratzer et al. 2022)	The Fractional CIO in SMEs: conceptualization and research agenda	Journal	Interviews	2022	Fractional CIO, Virtual CIO, IT leadership, Part-time management, SMEs, Small businesses, Interim management
19	(Noonpakdee et al. 2020)	CIO Competency in Digital Era: A Comparative Study between Government Organizations and Private Enterprises	Conference	Interviews	2020	risk, digital era
20	(Stephens & Loughman 1994)	The CIO's chief concern: Communication	Journal	Interview	1994	Communication; Mintzberg, Metaphors
21	(Tagliavini et al. 2004)	Important CIO Features For Successfully Managing IS Subfunctions	Conference	Survey	2004	competence, IS subfunctions
22	(Zimmermann, Petrikina & Schroder 2016)	The CIO Leadership Mosaic -- Results from a Qualitative Survey in the Silicon Valley and San Francisco Bay Area	Conference	Survey	2016	
23	(Al-Taie, Lane & Cater-Steel 2014)	The Relationship Between Organisational Strategic IT Vision and CIO Roles: One size does not fit all	Journal	Survey	2014	Contingency approach to leadership, Organisational strategic IT vision, Chief Information Officer (CIO) Role, CIO's reporting structure, CIO's job title,
24	(Ross & Feeny 1999)	The evolving role of the CIO	Sloan Working paper	Literature analysis	1999	Not available
25	(Sampaio & Ferraz 2020)	The Technology Executive Role: A Study of the Main Competencies and Capabilities of the CIO / CTO	Conference	meta study	2020	Not available
26	(Singh, Barthel & Hess 2017)	Der CDO als Komplement zum CIO	Journal		2017	Not available
27	(Li et al. 2006)	Innovative Usage of Information Technology	Journal	survey	2006	Personality traits
28	(Stephens et al. 1992)	Executive or	Journal		1992	IS management, corporate roles and relationships, structured observation

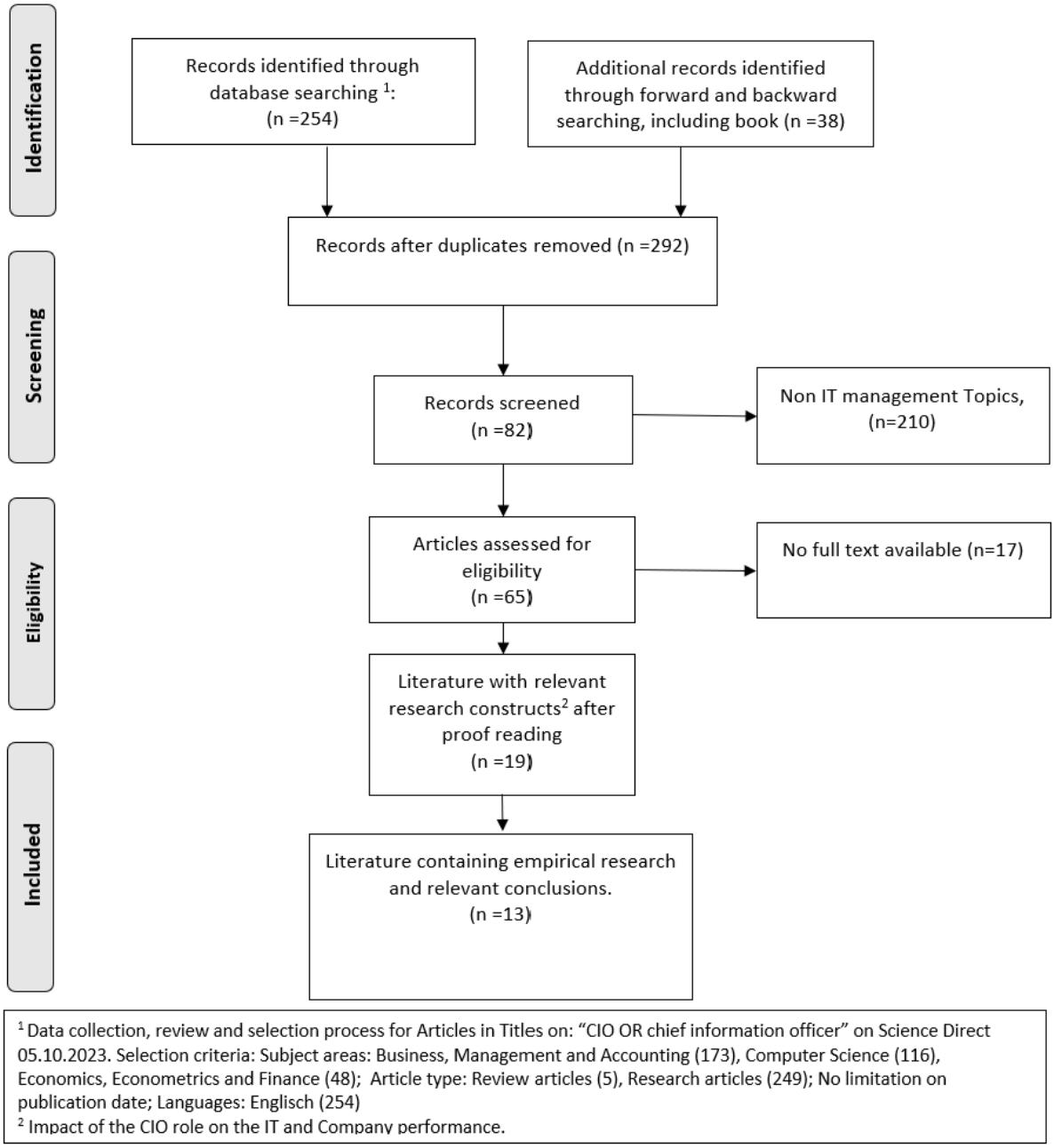
29	(Banker, Feng & Pavlou 2022)	Businessperson or Technologist: Stock Market Reaction to the Alignment between CIO Background and Firm Strategy	Journal	Secondary data	2022	CIO appointment, strategic positioning, CIO background; stock market reaction
CIO Compensation						
30	(Turedi & Erkan-Barlow 2022)	CIO equity compensation and IT investment: the moderating role of board monitoring and evidence of managerial myopia	Journal	Secondary data	2022	IT investment, CIO compensation, board monitoring, Agency theory
31	(Yayla & Hu 2008)	Determinants of CIO Compensation Structure and Its Impact on Firm Performance	Conference	Secondary data	2008	
32	(Liu, Hsu & Yen 2018)	Technology executives in the changing accounting information	Journal	Secondary data	2018	Executive compensation, Regulatory reform, International Financial Reporting Standards
CIO-C-Level Relationships and Communication						
33	(Bassellier, Gagnon & Pinsonneault 2008)	CIO and CEO Heterogeneity, IT Support, and IT Competitiveness in Stable and Unstable Environments: An Empirical Study	Conference	Quantitative survey	2008	CEO/CIO Heterogeneity, Organizational support for IT, IT performance, competitive position, PLS
34	(Enns, Huff & Golden 2001)	How CIOs obtain peer commitment to strategic IS proposals: Barriers and facilitators	Journal	Interviews, Survey	2001	Behavior, Information systems, Strategic planning level
35	(Fell 2013)	Optimizing the CEO-CIO Relationship	Book		2013	Working relationship
36	(Hütter, Arnitz & Riedl 2013)	Die CIO/CEO-Partnerschaft als Schlüssel zum IT-Erfolg	Journal		2013	Not available
37	(Hütter, Arnitz & Riedl 2016)	Effective CIO/CEO Communication	Conference	Literatrue review	2016	Not available
38	(Johnson & Lederer 2003)	Two predictors of CEO/CIO convergence	Conference	Survey	2003	Not available
39	(Johnson & Lederer 2006)	The Impact of CEO/CIO Convergence on IT Strategic Alignment.	Conference	Matched pair survey	2006	Not available
40	(Johnson & Lederer 2009)	CEO/CIO Communication and the Strategic Grid Dimensions	Journal	Matched pair survey	2009	Not available
41	(Johnson & Lederer 2010)	CEO/CIO mutual understanding, strategic alignment, and the contribution of IS to the organization	Journal	Matched pair survey	2010	Mutual understanding of the role of IT, Strategic alignment, IT strategy, IS contribution
42	(Jones, Taylor & Spencer 1995)	The CEO/CIO relationship revisited: An empirical assessment of satisfaction with IS	Journal	Matched pair survey	1995	Relationship between CEO and CIO, Satisfaction with information systems, Strategic planning, Role of information technology in strategic planning, Strategic information systems planning, Information technology in

						the motor carrier industry, CEO satisfaction with IS, CIO perceptions of corporate use of IS
43	(Krotov 2015)	Bridging the CIO-CEO gap: It takes two to tango	Journal	Literature analysis	2015	IT strategy; Information systems; Executive relationships;
44	(Kettner)	„CEOs sollten ihre CIOs verstärkt als Partner sehen.“	Journal	Single interview	2013	Not available
45	(Randall, Ban & Marshall 2013)	How CEOs, CIOs and CMOs see the technology future of corporate openness, customer individualization and innovation partnerships	Journal	Survey	2013	Not available
46	(Rao et al. 2017)	Evaluating the importance of CTO/CIO social networks in IT companies	Conference	Secondary data	2017	Not available
47	(Rim, McLean & Purr 1993)	Sizing up the CIO/CEO Partnership	Journal	Matched pair survey	1993	Not available
48	(Tai & Phelps 2000)	CEO and CIO perceptions of information systems strategy: Evidence from Hong Kong	Journal		2000	
49	(Whitler, Boyd & Morgan 2017)	The criticality of CMO-CIO alignment	Journal	Interviews	2017	CIO-CMO relationship; Top management team; Executive staff; Leadership strategy
50	(Appleby 1997)	Interface ... or in your face. The CEO/CIO relationship	Journal		1997	Not available
51	(Gora 2015)	Der Controller als Brückenbauer zwischen CIOs und CEOs	Journal	Viewpoint	2015	Not available
52	(Haffke & Benlian 2013)	To understand or to be understood? A dyadic analysis of perceptual congruence and interdependence between CEOs and CIOs	conference	Matched pair survey	2013	Not available
53	(Huang, Leelien Ken, Quaddus, Mohammed 2008)	An Analysis of IT Expectation across Different Strategic Context of Innovation: the CEO versus the CIO.	Conference	Matched pair survey	2008	Innovation, IT Expectation, Strategic Alignment
54	(Arnitz, Hütter & Riedl 2017)	Mutual Trust between the Chief Information Officer and Chief Executive Officer: Insights from an Exploratory Interview Study	Journal	Interview	2017	CIO Decision Latitude, Information Behavior, IT Management, Common Language, Top Management, Trust, Trustworthiness.
55	(Karahanna & Preston 2013)	The Effect of Social Capital of the Relationship Between the CIO and Top Management Team	Journal	Matched pair survey	2014	Not available

		on Firm Performance				
56	(Ulrich & Lehmann 2018)	Das Spannungsfeld zwischen CFO, CIO und CDO:	Management review		2018	Not available
57	(Vinaja 2018)	On the nature of effective CIO/CEO communication:	Journal	Interview	2018	Not available
58	(Bendig et al. 2022)	When and why technology leadership enters the C-suite: An	Journal	Metastudy	2022	
59	(Benlian & Haffke 2016)	Does mutuality matter? Examining the bilateral nature and effects of CEO–CIO mutual understanding	Journal	Matched pair survey	2016	CIO–CEO partnership, Social alignment, Mutual understanding, Perspective-taking, Perceptual congruence model, Actor–partner interdependence model
60	(Feeny, Edwards & Simpson 1992)	Understanding the CEO/CIO Relationship	Conference	Matched pair interviews	1992	Not available
Organizational Performance						
61	(Banker et al. 2010)	CIO Reporting Structure, Strategic Positioning, and Firm Performance: To Whom Should the CIO Report?	Journal	Quantitative based on secondary data	2010	Reporting Structure, Strategic Positioning, Porter's Generic Strategies, Product/Service Differentiation, Cost Leadership, Firm Performance, Abnormal Stock Returns, Cash Flows from Operations
62	(Banker et al. 2011)	CIO REPORTING STRUCTURE, STRATEGIC POSITIONING, AND FIRM PERFORMANCE	Journal	Quantitative based on secondary data (two surveys and Compustat).	2011	reporting structure, strategic positioning, Porter's generic strategies, product/service differentiation, cost leadership, firm performance, abnormal stock returns, cash flows from operations
63	(Earl & Feeny 1994)	Is Your CIO Adding Value?	Management Review Journal		1994	Not available
64	(Khallaf & Skantz 2015)	R&D productivity following first-time CIO appointments	Journal	Secondary data	2015	CIO appointments, R&D productivity, IT capability
65	(Khallaf & Skantz 2011)	Does long term performance improve following the appointment of a CIO?	Journal	Secondary data	2011	CIO appointments, CIO capabilities, Long term performance, IT investments
66	(La Paz, Lobos & Lopez 2018)	CIO Performance Measurement	Conference	Literature analysis	2018	IT performance measurement, IT alignment, performance management.
67	(Tagliavini et al. 2003)	Shaping CIO's competencies and activities to improve company performance: an empirical study.	Conference	Interviews	2003	Information System Subfunction, Company Performance, Chief Information Officer, Competencies
68	(McClure & Bertot 2000)	The chief information officer (CIO): Assessing its impact	Journal	Regulations	2000	Not available
69	(Ravarini et al. 2001)	Exploring the impact of CIO competencies on company performance.	Conference	Research in progress	2001	Not available

70	(Smaltz, Sambamurthy & Agarwal 2006)	The antecedents of CIO role effectiveness in Organizations: An empirical study in the healthcare sector	Journal	Survey	2006	(CIO) capability, CIO roles, CIO role effectiveness, CIO-top management team (TMT), engagements, healthcare industry,
71	(Smith, Tadesse & Vincent 2021)	The impact of CIO characteristics on data breaches	Journal	Secondary data	2021	Cybersecurity, CIO characteristics, Human capital, Structural capital
72	(Sobol & Klein 2009)	Relation of CIO background, IT infrastructure, and economic performance	Journal	Survey	2009	Information technology infrastructure, Financial performance, Leadership
73	(Chen & Wu 2011)	IT management capability and its impact on the performance of a CIO	Journal	Matched pair survey	2011	Information technology management, Role performance, Activity competency model, Competency development
74	(Ding, Li & George 2014)	Investigating the effects of IS strategic leadership on organizational benefits from the perspective of CIO strategic roles	Journal	Matched pair survey	2014	IS strategic leadership IS quality Organizational benefits of IS IS vision
75	(Peppard 2010)	Unlocking the Performance of the Chief Information Officer (CIO)	Management Review	Overview article on CIO research	2010	Not available
76	(Taylor & Vithayathil 2018)	Who delivers the bigger bang for the buck: CMO or CIO?	Journal	Secondary data	2018	Firm performance, Power, Managerial power, Executive power, Information technology
Strategy and Business IT Alignment						
77	(Bolshakov & Lewis 2021)	CIO Strategy and Selectivity Theory	Journal	Quantitative secondary data	2021	Portfolio Optimization, Selectivity Theory, CIO Strategy, Investment Manager Selection
78	(Hinde 2005)	CIOs at the heart of IT all	Journal		2005	Not available
79	(Li & Tan 2013)	Matching business strategy and CIO characteristics: The impact on organizational performance	Journal	Survey	2013	Business strategy alignment, Chief information officer characteristics, Organizational performance, Personality
80	(Pinho & Franco 2017)	The Role of the CIO in Strategy for Innovative Information Technology in Higher Education Institutions	Journal	Survey	2017	Personality traits
Other						
81	(Gerth & Peppard 2020)	Advice from CIO to CIOs	Book		2020	Not available
82	(Watts & Henderson 2006)	Innovative IT climates: CIO perspectives	Journal	Interview	2006	Innovative IT; Technology leadership; Climate;

Appendix B: Process of literature selection and used criteria of literature review to determine quantitative Chief Information Officer research



[1] Data collection, review and selection process for Articles in Titles on: "CIO OR chief information officer" on Science Direct 05.10.2023. Selection criteria: Subject areas: Business, Management and Accounting (173), Computer Science (116), Economics, Econometrics and Finance (48); Article type: Review articles (5), Research articles (249); No limitation on publication date; Languages: Englisch (254)

[2] Impact of the CIO role on the IT and Company performance.

Source: author's literature review, displayed according to the PRISMA-P method (Moher et al., 2015).

Appendix C: Interview guideline for in-depth interviews expert interviews

Halbstrukturiertes Interview

zur Verwendung in der Dissertation von Bjarne Erik Roscher an der Universität von Lettland.

Preface:

In der Literatur wird die Leistungsfähigkeit von Organisation oft mit den Arbeitseinstellungen der Mitarbeiter in Zusammenhang gebracht. Ausserdem werden verschiedene zwischenmenschliche und prozessuale Faktoren für die Entwicklung verschiedener Arbeitseinstellungen wie Motivation und Zufriedenheit benannt.

In diesem Interview möchte ich im speziellen auf die Gruppe des Top Managements (also der C-Level Manager bzw. Prozessowner) und ihre Arbeitseinstellungen eingehen. Dabei ist es mir wichtig Ihre Sicht und Meinungen als Experte und ihre Erfahrung als Führungskraft zu diesem Thema zu ergründen.

Für das Interview erarbeitete Fragenkomplexe:

Biographische Fragen und Eingangsfragen:

- Haben Sie selbst Führungserfahrung? Wenn ja: Wie lange? In welchen Gruppen (Shopfloor, Office, R&D, etc.) waren Ihre MA? Was war ihre größte Führungsspanne?
- Welche Funktionen als Vertreter von Verbänden haben Sie bisher gehabt? Wie lange sind/waren Sie in diesen Funktionen?
- Sind Sie mit der Nennung ihres vollen Namens oder ihrer Anfangsbuchstaben einverstanden?
- Sind Sie mit der Aufnahme des Interviews einverstanden sowie mit der (teilweisen) Verschriftlichung der Inhalte?

Hauptfragen:

1. Welche Arbeitseinstellungen von Top Managern sind für den Erfolg (der Organisation) am wichtigsten?
2. Welche prozessoralen Faktoren beeinflussen die Arbeitseinstellungen von Top Managern aus Ihrer Sicht am nachhaltigsten?
3. Welche zwischenmenschlichen Faktoren beeinflussen die Arbeitseinstellungen von Top Managern aus Ihrer Sicht am nachhaltigsten?
4. Welche Bedeutung hat Information für Sie im Verhältnis zwischen Geschäftsführung (GF) und Top Managern?

Detailierungsfragen:

5. Wie wichtig ist aus Ihrer Sicht ein gutes Vertrauensverhältnis zwischen Führungskraft und Mitarbeiter und wie erklären Sie sich das?
6. Wie wichtig ist es aus Ihrer Sicht, dass die GF ein grundlegendes Verständnis über den Tätigkeitsbereich und die Arbeitsinhalte des Top Managers hat. Wie erklären Sie sich das?
7. Verändert die Nutzung von KPIs in den Teilorganisationen die Arbeitseinstellung der verantwortlichen Top Manager?
8. Was ist aus Ihrer Sicht die optimale Führungsspanne von Top Managern und welche Auswirkungen hat das auf die Arbeitseinstellung dieser Top Manager?
9. Wie wichtig ist es aus Ihrer Sicht, dass die Firma ein Performance Management System und ein Incentive System hat und welche auswirkung hat das auf die Motivation und die Zufriedenheit von Top Managern.

Abschlussfrage:

1. Gibt es einen Unterschied zwischen einem Top-IT-Manager oder irgend einem anderen C-Level Manager (wie z.B. Leiter Entwicklung, Leiter Marketing, Leiter Logistik etc.)in Bezug auf das worüber sie bisher mit mir gesprochen haben?

Anmerkung:

Die Fragen dieses Interviewleitfaden dienen der Orientierung für den Inhalt des Interviews. Die Fragen (insbesondere die Detailierungsfragen) müssen nicht alle und nicht in der vorgegebenen Reihenfolge beantwortet werden

Appendix D: Detailed analysis of the interviews regarding procedural factors which influence work attitudes

Factor	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Interviewee 7
Communication & Decision-Making	Emphasized importance of clear and transparent communication and structured decision-making processes.	Highlighted the role of a positive and inclusive organizational culture, along with leadership styles that promote collaboration and empowerment.	Stressed the importance of performance evaluation processes being fair and objective, linked to rewards and recognition.	Focused on the role of goal-setting and alignment with the organization's mission and vision in motivating top managers.	Underlined the significance of feedback and continuous improvement processes as motivators for top managers.	Discussed the impact of decision accountability and delegation processes on top managers' work attitudes.	Emphasized the need for short reporting lines, simplified hierarchies, clear task allocation, and transparent responsibilities.
Organizational Culture & Leadership	Emphasized the importance of effective communication and structured decision-making processes in influencing work attitudes.	Highlighted the significance of a positive and inclusive culture and leadership styles that encourage collaboration and empowerment.	Recognized the impact of a positive organizational culture and leadership that promotes collaboration and empowerment.	Mentioned the importance of a positive culture and leadership that aligns with organizational goals.	Recognized the value of constructive feedback loops and opportunities for learning and development in shaping work attitudes.	Discussed the role of decision autonomy and responsibility in top managers' work attitudes.	Stressed the need for clear, transparent, and reliable processes, including task allocation and responsibilities.
Performance Evaluation & Recognition	Highlighted the importance of clear and transparent performance evaluation processes, linked to rewards and recognition, as motivators for top managers.	Underlined the role of a positive culture and leadership in motivating top managers through rewards and recognition.	Emphasized fair and objective performance evaluation processes as key motivators for top managers.	Mentioned the role of performance evaluation processes and their link to rewards and recognition in influencing work attitudes.	Recognized the importance of feedback and continuous improvement processes in shaping work attitudes.	Discussed the significance of decision accountability and delegation for work attitudes among top managers.	-
Goal-Setting & Alignment	-	-	-	Emphasized the role of clear goal-setting and alignment with the organization's mission and vision in motivating top managers.	-	-	-
Feedback & Continuous Improvement	-	-	-	-	Highlighted the importance of feedback and continuous improvement processes in shaping work attitudes.	-	-
Decision Accountability & Delegation	-	-	-	-	-	Emphasized the role of decision accountability and delegation, suggesting that autonomy in decision-making can positively influence top managers' attitudes.	-

Appendix E: Detailed analysis of the interviews regarding interpersonal factors which influence work attitudes

Themes/Aspects	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Interview 6	Interview 7
Leadership Compatibility	Emphasized the need for values alignment with top managers.	Highlighted compatibility based on enjoying working together.	Stressed team dynamics and compatibility between leaders and team members.	Focused on enjoying working with colleagues and building trust.	Recognized compatibility and positive relationships as important.	Highlighted compatibility and relationships at the same hierarchical level.	Emphasized the importance of personal biases and adaptability.
Openness and Communication	Emphasized the importance of open communication and alignment with the values of the company.	Highlighted openness and clear communication, especially in different cultural contexts.	Emphasized the role of interpersonal communication and understanding the reasons behind decisions.	Stressed the importance of open and friendly communication in the workplace.	Mentioned the significance of transparent communication and approachability.	Discussed the importance of trust, psychological safety, and reliance on team members.	Highlighted the need for promoting diverse opinions and encouraging adaptability.
Empathy and Team Dynamics	Discussed the need for empathy and building positive relationships.	Mentioned empathy and the importance of supportive work environments.	Focused on team dynamics, interdepartmental relationships, and external stakeholder	Highlighted the importance of enjoying working with colleagues and psychological safety.	Emphasized the role of empathy, trust, and support.	Discussed the significance of personal relationships, family support, and trust-building.	Underlined the value of valuing diverse opinions and adapting viewpoints.
Recognition and Reward	Highlighted the motivation from recognition and rewarding with challenging tasks.	Emphasized the motivating role of recognition and rewarding with interesting tasks.	Not mentioned explicitly.	Mentioned recognition but emphasized being motivated by challenging tasks.	Emphasized the importance of motivating tasks rather than monetary rewards.	Discussed recognition but focused more on personal motivation from tasks.	Not mentioned explicitly.
Trust and Psychological Safety	Discussed the importance of trust and psychological safety in the workplace.	Mentioned trust and reliance on colleagues.	Mentioned trust as important, especially in the context of team dynamics.	Emphasized trust, psychological safety, and the ability to rely on team members.	Highlighted trust, reliance, and psychological safety as important.	Underlined trust, both within and outside the organization, and the role of support.	Not mentioned explicitly.
Adaptability	Not explicitly mentioned.	Mentioned adaptability as essential in different cultural contexts.	Mentioned adaptability in understanding and responding to conflicts.	Highlighted the ability to adjust one's own opinion.	Suggested adaptability as a way to handle diverse tasks.	Mentioned adaptability in terms of family support and relationships.	Emphasized the importance of adaptability within leadership.

Appendix F: Highlights from the interviews regarding knowledge related factors which influence work attitudes

Point	Interviewee	Key Highlight
1. Proximity to the work	1	Top management should have a close understanding of subordinates' work for effective decision-making and alignment between leadership and workforce.
2. Evolution of leadership	2	Top management should not only understand but also engage in subordinates' work for effective leadership, including both knowledge and action.
3. Balancing micro and macro management	3	The challenge lies in balancing micro-management and hands-off management, depending on organizational culture and top management expectations.
4. Trust and delegation	4	Specific details of subordinates' tasks are less important; trust and delegation play a more significant role in achieving successful outcomes.
5. Facilitating effective communication	5	Top management must understand subordinates' roles for effective communication and goal alignment, preventing misunderstandings and supporting decisions.
6. Strategic sensitivity	6	"Strategic sensitivity" is crucial; top management should understand subordinates' roles for effective communication with stakeholders and alignment of strategies.
7. Balanced approach	7	A balanced approach is essential; top-level executives should have a basic understanding without being burdened with minutiae, asking meaningful questions instead.

Appendix G: Sources of construct items

Construct Items	Type of Variable	Used in hypotheses	Source
CIO Attitudes	Dependent	All	Park(Park, 2010)
Information Asymmetry Reduction Measures			
- Perceived Mutual Understanding	Independent	H_A, H1a, H2a	Own construction, partly inspired by Krecmar(Krcmar, 2015) and Durst(Durst, 2007)
- Business IT Alignment	Independent	H_A, H1b, H2b	Termer and Nissen(Termer and Nissen, 2013)(Termer, 2015)
Moral Hazard Reduction Measures			
- Performance Management System	Independent	H_A, H1c, H2c	Park(Park, 2010)
- Incentive System	Independent	H_A, H1d, H2d	Park(Park, 2010)
Agent Trust in Principal	Moderator	H_B, H3.1a-d, H3.2a-d	Podsakoff(Podsakoff et al., 1990)
Principal IT Knowledge	Moderator	H_C, H4.1a-d, H4.2a-d,	Termer and Nissen(Termer and Nissen, 2013)(Termer, 2015)(Nissen and Termer, 2014)
KPI Usage Score	Confounding		Own construct
Effectivity of IT	Confounding		Termer(Termer, 2015), Durst(Durst, 2007)
Leadership span (Only on dependent variable job satisfaction)	Confounding		Own construction

Appendix H: Detailed results of the pilot study

The pilot study was done on the 26th and 27th of November 2021. Personally known contacts of the researcher, have been contacted. All of them have held the position of CIO, either currently, until their recent pensioning, before their last assignment or they have been board members with IT responsibility.

Participants who answered the first question (screener-question) 'Which statement applies to you?' with 'nothing of all' were automatically directed to the last page of the questionnaire telling them that they were not qualified for this survey:

Vielen herzlichen Dank für Ihre Teilnahme.

Falls Sie bereits nach der ersten Frage hier gelandet sind entspricht Ihre aktuelle Tätigkeit leider nicht der Zielgruppe dieser wissenschaftlichen Umfrage.

Mit freundlichen Grüßen

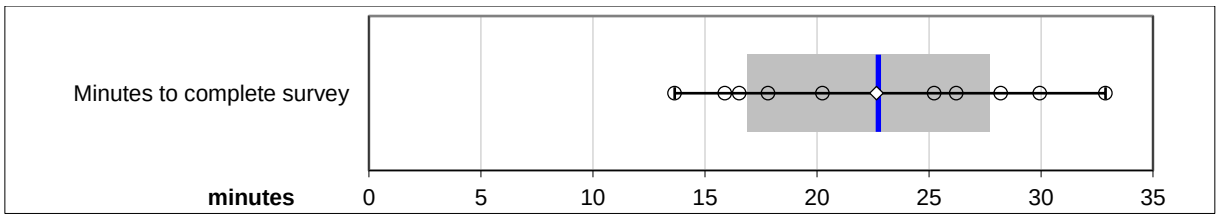
Bjarne Erik Roscher

Welche Aussage trifft aktuell auf Sie zu: (Which statement applies to you:)

Total	Valid*	
2	2	Ich bin aktuell als CIO/IT Leitung tätig. (I am currently working as a CIO/Head of IT)
6	6	Ich war bis zu meinem Ausscheiden in den Ruhestand als CIO/IT Leitung tätig. (Until retiring I have been working as CIO/Head of IT)
3	1	Ich war in der Vergangenheit als CIO/IT Leitung tätig. (I have formerly been working as CIO/Head of IT)
2	1	Ich bin Vorstand und verantwortlich für den IT Bereich. (I am a Board member and responsible for the IT Organization)
0	0	Ich bin IT Abteilungsleiter. (mit Verantwortung für Teil-Strategie, Applikationen, Infrastruktur und Teil-Budget) (I am the IT Department head and responsible for a part of the strategy, applications, infrastructure, and part of the Budget)
1	0	Non of all

*Valid responses are all datasets that have been completed from beginning to end.

Of the 14 participants, only 10 completed the questionnaire. Two dropped out very early with very high inactivity values. Two others without obvious reasons. Johanson and Brooks (Johanson and Brooks, 2010) report on sample sizes of pilot studies from different scholars in the range of 10 to 30 participants. The average time for completing the survey was 22,7 minutes:



In line with the descriptive statistics of the main survey age and gender were analysed:

How old are you?

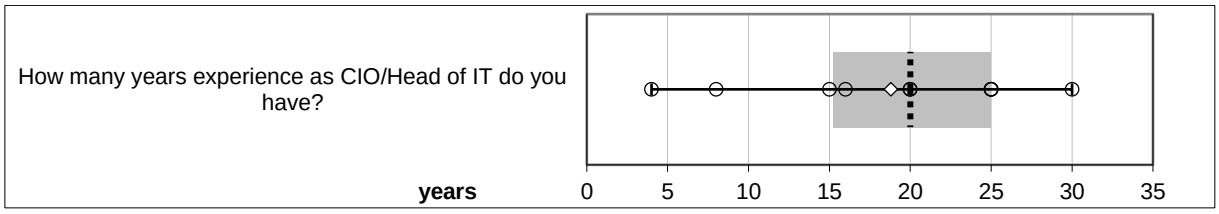
		Frequency	Percent	Valid Percent
Not Valid		4	28,6	
Valid	< 30 years	0	0,0	0,0
Valid	30 to 39 years	0	0,0	0,0
Valid	40 to 49 years	2	14,3	20,0
Valid	50 to 59 years	3	21,4	30,0
Valid	>= 60 years	5	35,7	50,0
	not answered	0	0,0	0,0
	Total	14	100,0	100,0

What is your gender

		Frequency	Percent	Valid Percent
Missing		4	28,6	
Valid	Male	9	64,3	90,0
Valid	Female	0	0,0	0,0
Valid	Divers	1	7,1	10,0
	Total	14	100,0	100,0

Additionally, the CIO Background has been analyzed within the pilot study and this is within expected borders:

How long have you be working as CIO in your life? (only valid answers)



Research limitations and implications of the pilot study

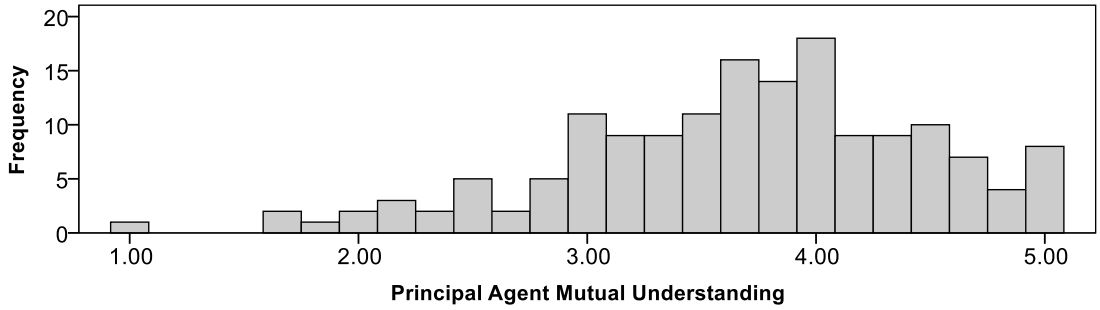
The pilot study showed that the scales for the research are feasible. In order to increase response rates incentives like a lottery and the use of multipliers (professional networks and CIO associations) could increase the reach of the survey.

Appendix I: Descriptive statistics of variables

Descriptive statistics of variables:

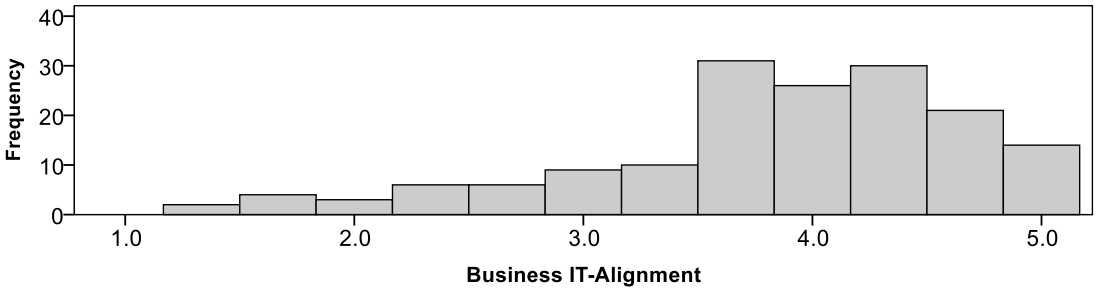
Descriptive statistics of variables						
Variable	**Answer format**	**N**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
WM Work Motivation	1 - 6 do not agree at all - absolutely agree	162	3.50	6.00	5.27	0.53
JS Job Satisfaction	1 - 6 do not agree at all - absolutely agree	162	1.33	6.00	4.98	1.02
PAM Principal Agent Mutual Understanding	1 - 5 non-existent - very good	158	1.00	5.00	3.68	0.79
MIS Monetary Incentive System	1 - 6 do not agree at all - absolutely agree	161	1.00	5.75	3.59	1.01
PMS Performance Monitoring System	1 - 6 do not agree at all - absolutely agree	160	1.40	6.00	4.29	1.05
BITA Business IT-Alignment	1 - 5 not at all - very good	162	1.33	5.00	3.84	0.84
PAT Principal Agent Trust	1 - 5 not at all - very good	161	1.00	5.00	4.03	1.01
PIK Principal IT Knowledge	1 - 5 non-existent - very good	161	1.50	5.00	3.20	0.81
KUS IT specific KPI usage score (0-8)	0 - 8 calculated scale	158	0.00	8.00	4.11	2.39
Effec IT Effectivity	1 - 5 not at all - completely	162	2.00	5.00	3.94	0.68
LS How many IT department heads are reporting directly to you?	1 - 7 one - seven or more	140	1.00	7.00	3.31	2.02
TI Turnover Intention	1 - 6 do not agree at all - absolutely agree	161	1.00	6.00	2.73	1.35

Perceived principal agent mutual understanding (PAM) histogram:



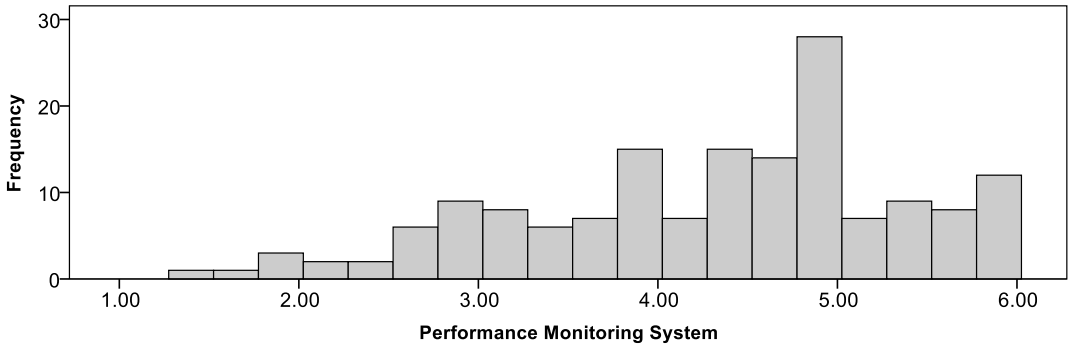
(1=not available, 5=very good)

Business IT alignment (BITA) histogram:



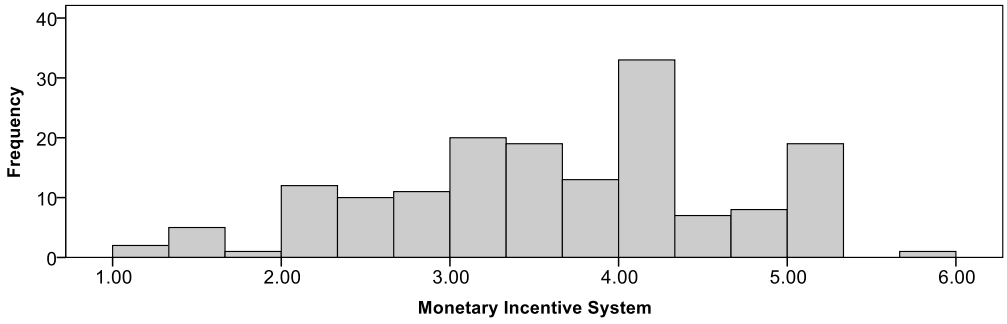
(1=not at all, 6=very good)

Performance management system (PMS) histogram:



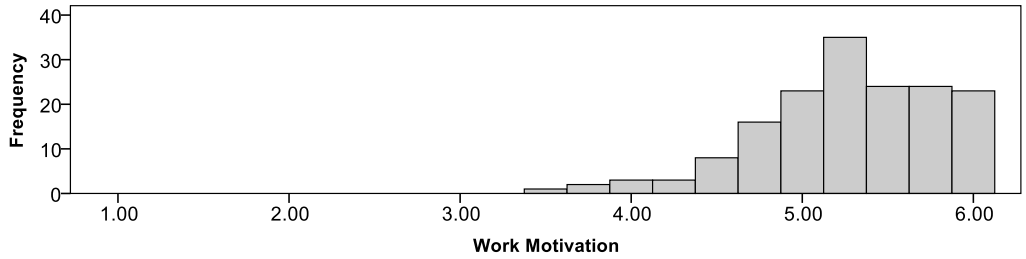
(1=don't agree, 6=fully agree)

Monetary incentive system (MIS) histogram:



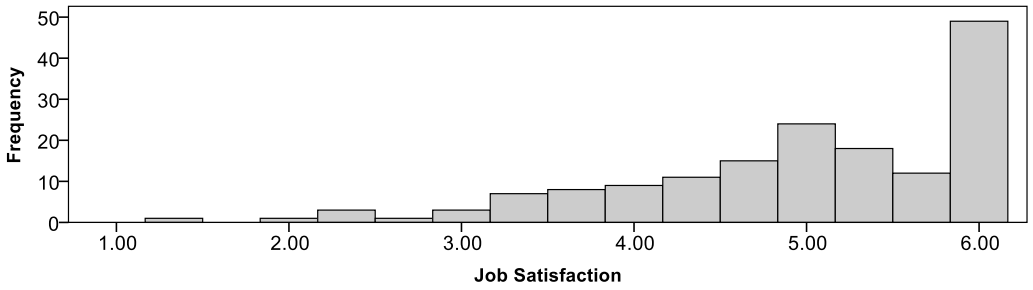
(1=don't agree ; 6=fully agree)

Work motivation (WM) histogram:



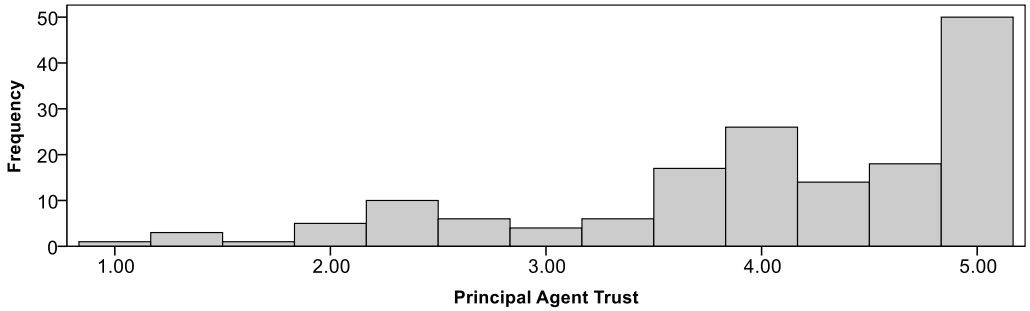
(1=don't agree, 6=fully agree)

Job satisfaction (JS) histogram:



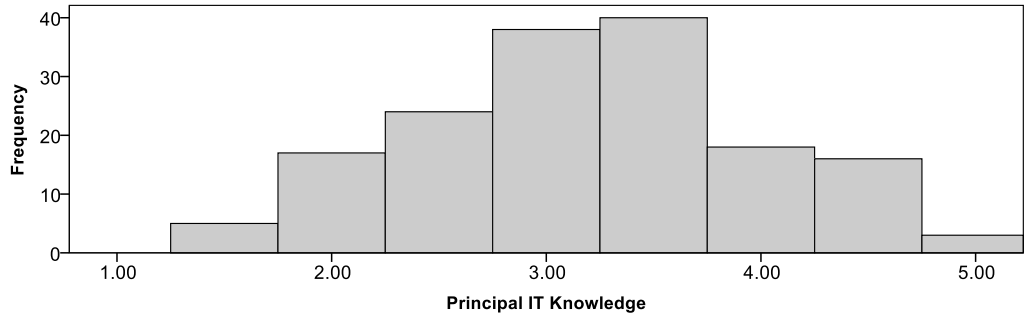
(1=don't agree, 6=fully agree)

Trust in principal (PAT) histogram:



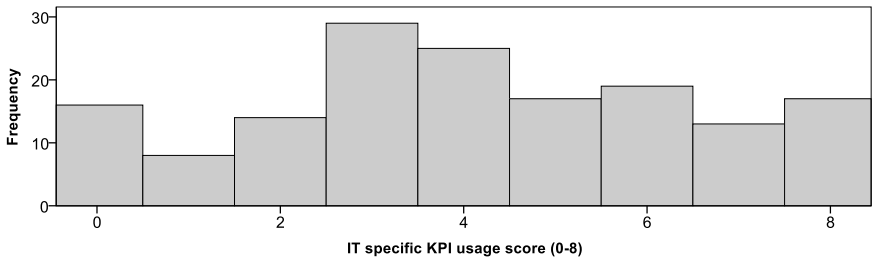
(1=don't agree, 5=fully agree)

Principal IT knowledge (PIK) histogram:

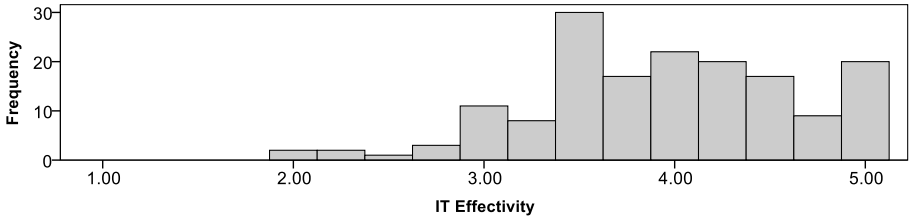


(1=not at all, 5=very good)

Key performance indicator usage score (KUS) histogram:

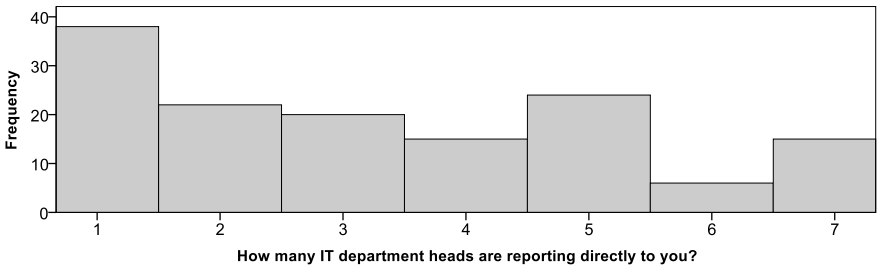


IT effectivity (Effec) histogram:



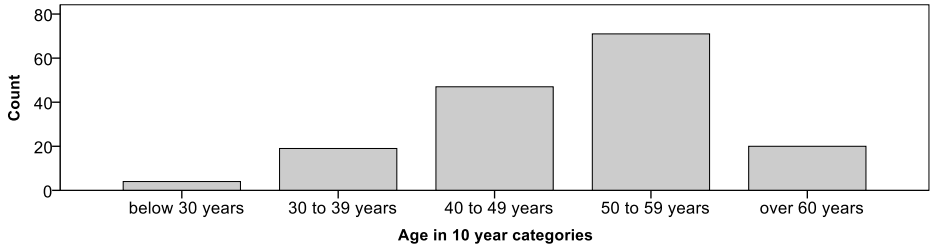
(1=not at all, 5= completely)

Leadership span (LS) histogram:



(scale in number of persons)

Age distribution:



(scale in 10 year categories)

Appendix J: Factor analysis for IT effectivity covariate (Effec)

The following SPSS 22 code was used to calculate the Effec Covariate:

```
FREQUENCIES IM01_01 IM01_02 IM01_03 IM01_04 IM01_05 IM01_06 IM01_07 IM01_08
IM01_09 IM01_10.

FACTOR
  /VARIABLES IM01_01 IM01_02 IM01_03 IM01_04 IM01_05 IM01_06 IM01_07
IM01_08 IM01_09 IM01_10
  /MISSING LISTWISE
  /ANALYSIS IM01_01 IM01_02 IM01_03 IM01_04 IM01_05 IM01_06 IM01_07 IM01_08
IM01_09 IM01_10
  /PRINT INITIAL EXTRACTION ROTATION
  /FORMAT SORT BLANK(.10)
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25) DELTA(0)
  /ROTATION OBLIMIN
  /METHOD=CORRELATION.

**** Item exclusion both due to results of the EFA and based on topic-based
considerations built on the publicaion of Durst (2007) p. 94 and Kempis et
al. (1998) p.21 ****.

FACTOR
  /VARIABLES IM01_01 IM01_03 IM01_04 IM01_05 IM01_06 IM01_07
  /MISSING LISTWISE
  /ANALYSIS IM01_01 IM01_03 IM01_04 IM01_05 IM01_06 IM01_07
  /PRINT INITIAL EXTRACTION ROTATION
  /FORMAT SORT BLANK(.10)
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25) DELTA(0)
  /ROTATION OBLIMIN
  /METHOD=CORRELATION.
```

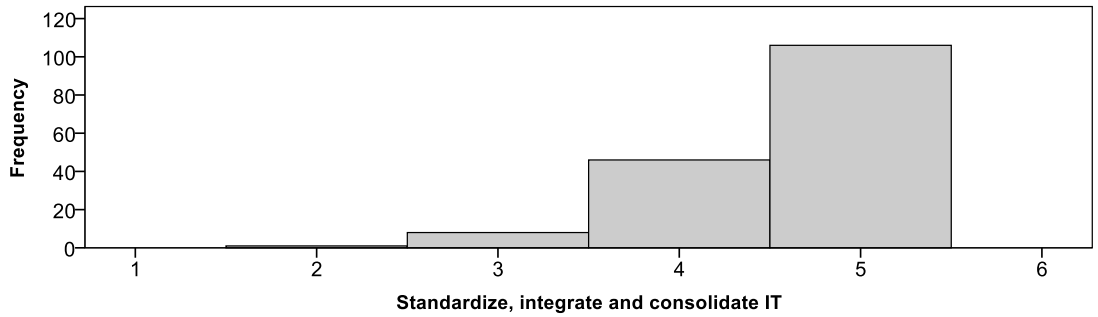
```
RELIABILITY
  /VARIABLES=  IM01_01 IM01_03
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

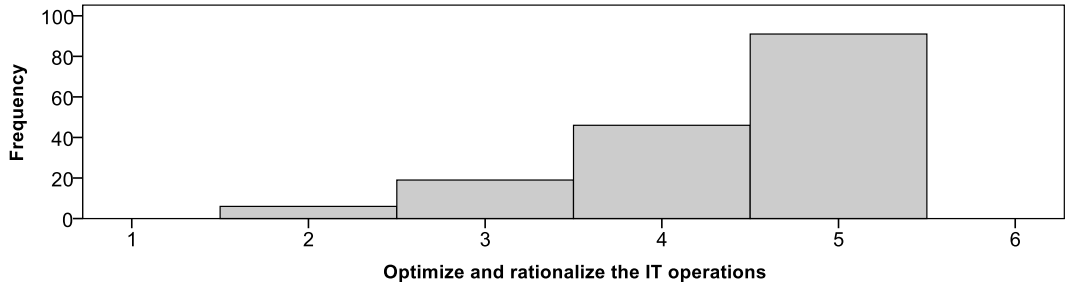
Reliability Statistics

Cronbach's Alpha	N of Items
.506	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
IM01_01 Standardize, integrate and consolidate IT	4.37	.698	.355	.
IM01_03 Optimize and rationalize the IT operations	4.60	.380	.355	.






```
* Factor Efficiency is not calculated due to bad Cronbach's Alpha and
skewed distribution of the variable.
```

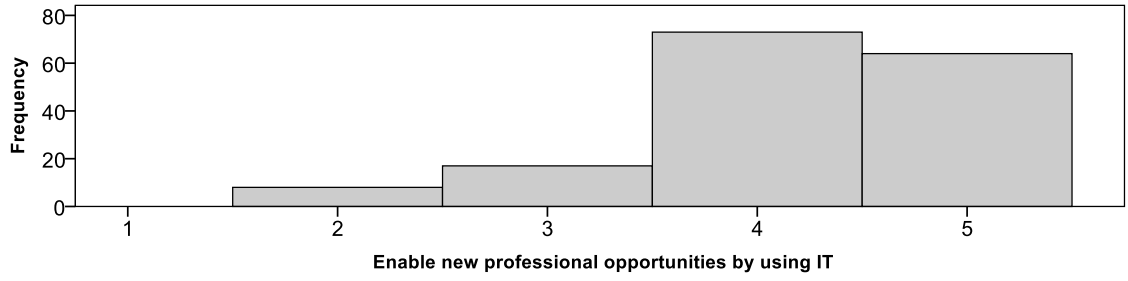
```
RELIABILITY
  /VARIABLES=  IM01_04 IM01_05 IM01_06 IM01_07
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

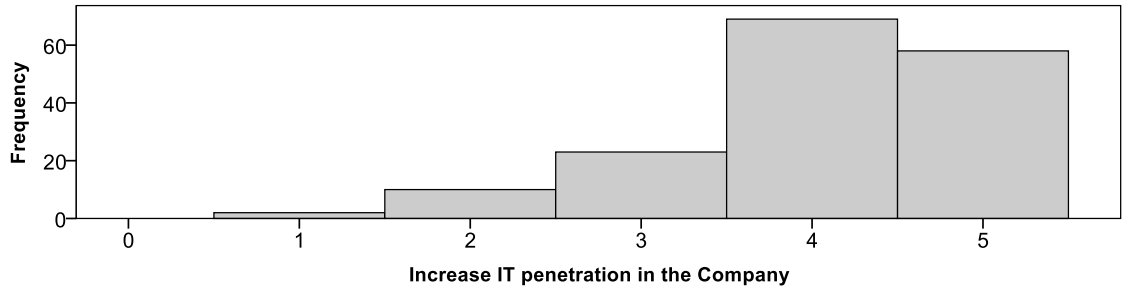
Reliability Statistics

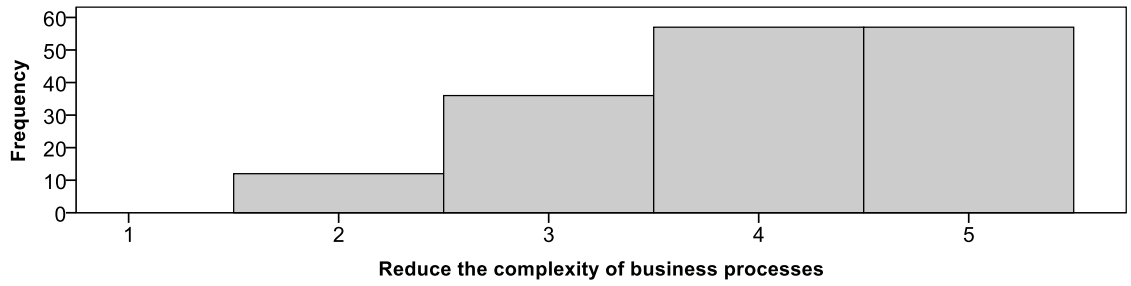
Cronbach's Alpha	N of Items
.674	4

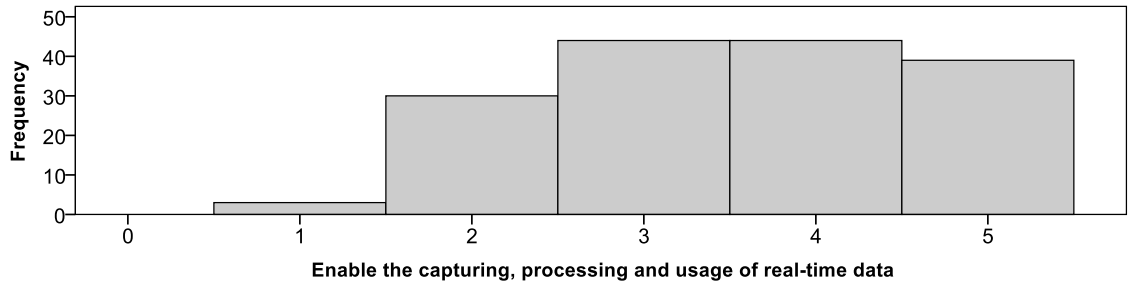
Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
IM01_04 Enable new professional opportunities by using IT	11.55	4.865	.504	.586
IM01_05 Increase IT penetration in the Company	11.69	4.644	.460	.605
IM01_06 Reduce the complexity of business processes	11.76	4.748	.423	.629
IM01_07 Enable the capturing, processing and usage of real-time data	12.19	4.057	.460	.613

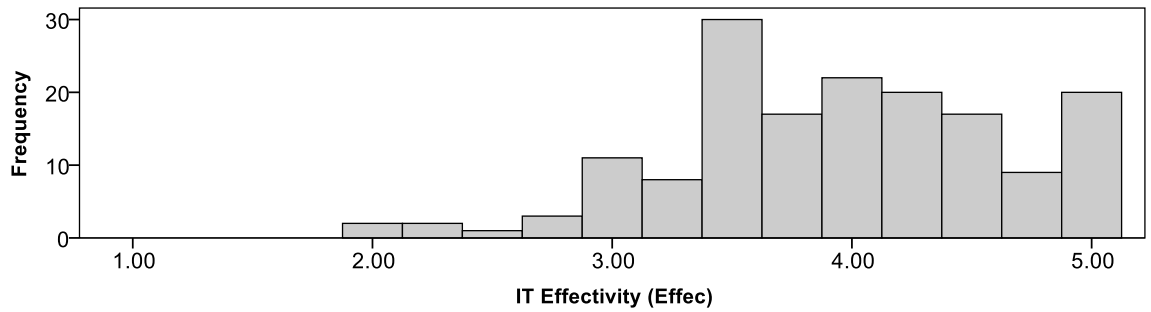






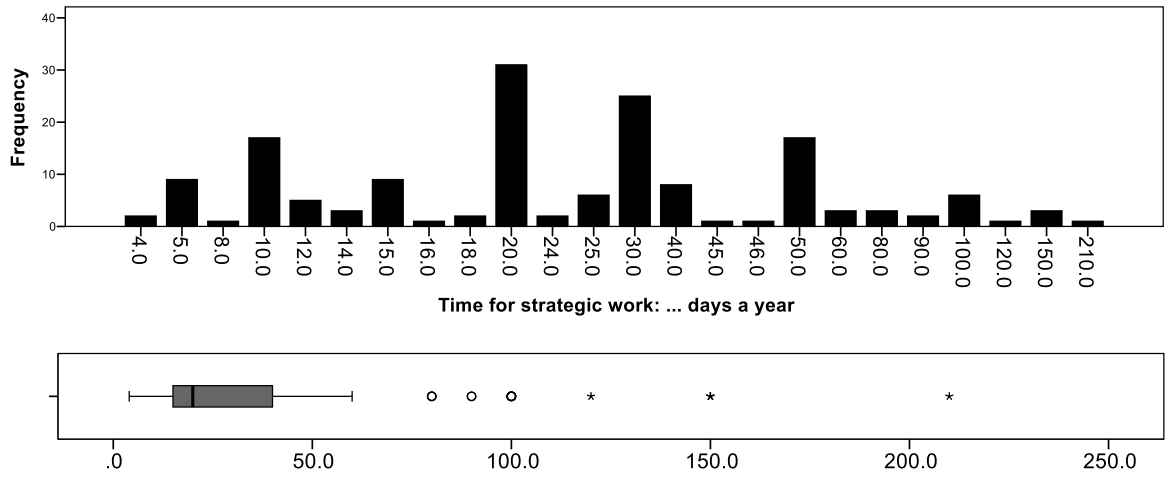



```
COMPUTE Effec = MEAN.3( IM01_04, IM01_05, IM01_06, IM01_07).
EXECUTE.
VALUE LABELS Effec
1 'gar nicht'
5 'vollständig'.
```

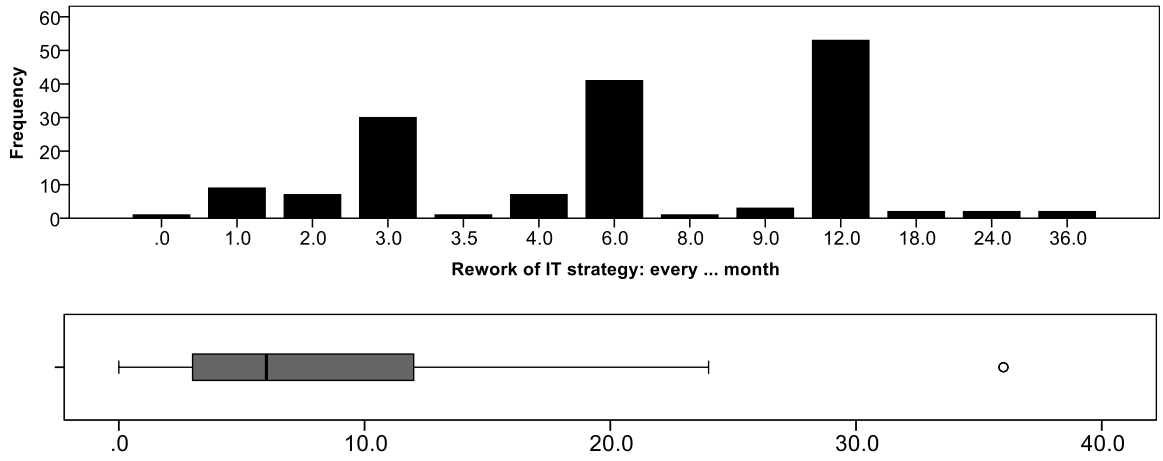


1. CIO strategic planning

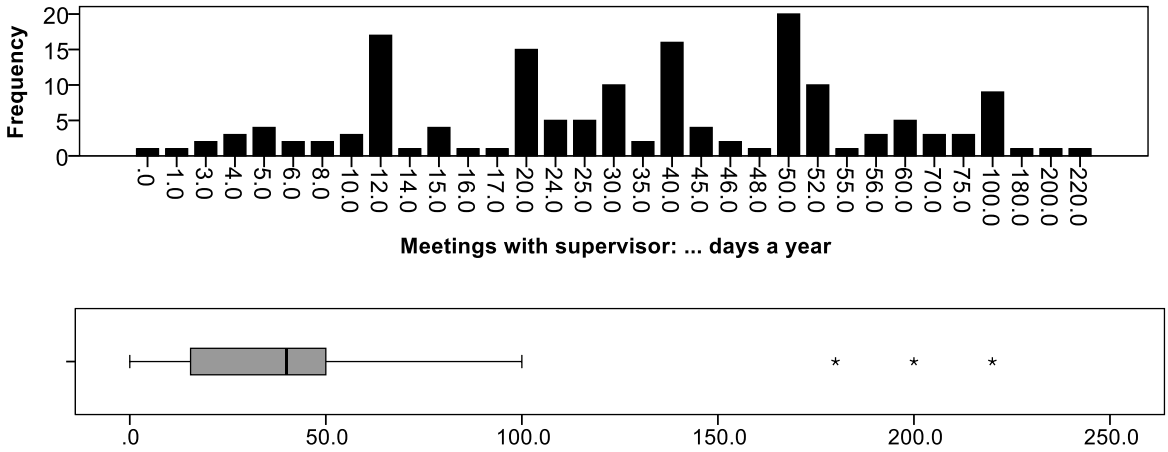
Time for strategic work:



2. Rework of IT strategy



3. Frequency of meetings with the supervisor



Appendix K: Questionnaire German version

Two different versions of the questionnaire were used in the survey period from November 22nd, 2020 to February 22nd, 2021.

Version 1 from 11/22/2020 to 12/06/2020.

Version 2 from 6/12/2020 to 22/02/2021.

The questions used in the questionnaires are identical, but the order was changed following feedback from respondents and the high drop-out rate.

The content of the questionnaire in version 1 and version 2 is identical, just sorted differently. The cross-reference table allows identifying the different sorting. The leading questioner is version 2 as more qualified completely answered questionnaires have been submitted.

Sehr geehrte CIO Kolleginnen und Kollegen,

im Zuge meiner beruflichen Neuausrichtung, promoviere ich an der Universität von Lettland im Bereich Management Wissenschaften zum Themenbereich IT Management, Bezahlungsstruktur und Organisatorische Einbindung der IT.

Ich möchte Sie heute einladen an dieser wissenschaftlichen Umfrage teilzunehmen. Die Ergebnisse werden für meine Lehre, Abschlussarbeiten meiner Studenten sowie meine eigene Dissertation verwendet. Die Ergebnisse werden auf wissenschaftlichen Konferenzen und in wissenschaftlichen Zeitschriften/Büchern veröffentlicht und sind für Sie jederzeit einsehbar unter https://www.researchgate.net/profile/Bjarne-Erik-Roscher.

Als Anreiz verlose* ich für alle Personen in CIO/IT Leiter Position **20 Amazon Gutscheine a 10€, 5 Amazon Gutscheine a 20€** sowie **einen Amazon Gutschein über 50€** unter den Teilnehmern, die Ihre Kontaktdaten zur Verfügung stellen.

Die Umfrage erfolgt anonym und es ist kein Rückschluss auf Sie oder Ihre Firma möglich.

Wenn Sie dennoch Bedenken haben einzelne Fragen zu beantworten, dürfen Sie diese gerne frei lassen.

Ich wäre Ihnen sehr dankbar, wenn Sie mich mit Ihrer Teilnahme unterstützen würden.

Bitte leiten Sie die Einladung gerne an Ihnen bekannte CIOs weiter!

Herzlichen Dank für Ihre Unterstützung

Ihr

Bjarne Erik Roscher

bjarne@roscher.net

https://www.linkedin.com/in/bjarneerikroscher/

* Verslosung:

- Die Losziehung erfolgt, nach Abschluss der Befragung ca. März. 2022, durch meinen Sohn.
- Der Rechtsweg ist ausgeschlossen.
- Die Gewinner werden per e-mail informiert.
- Die Kontaktdaten werden getrennt von der Umfrage erhoben und gespeichert.

Weiter

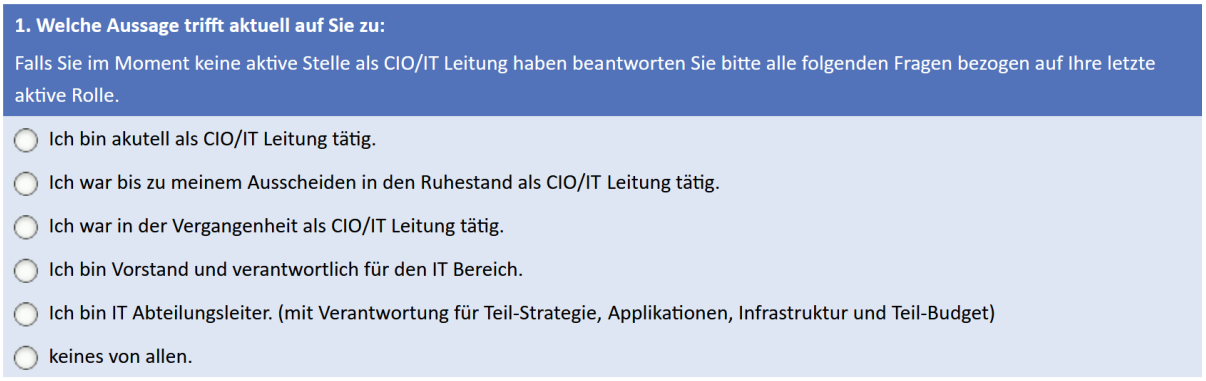
Dipl.Ing. (FH) Bjarne Erik Roscher,

https://www.researchgate.net/profile/Bjarne-Erik-Roscher

Doctoral Student at Faculty of Business, Management and Economics, University of Latvia;

Lehrbeauftragter an: Hochschule für Oekonomie und Management, Technische Hochschule Nürnberg, Hochschule für angewandte Wissenschaften Würzburg-Schweinfurt.

In Zusammenarbeit mit Prof. Dr. Volker Nissen von der Technischen Universität Ilmenau



If Question 1 was answered with "keines von allen" (nothing of all) the survey was ending with the following Message:

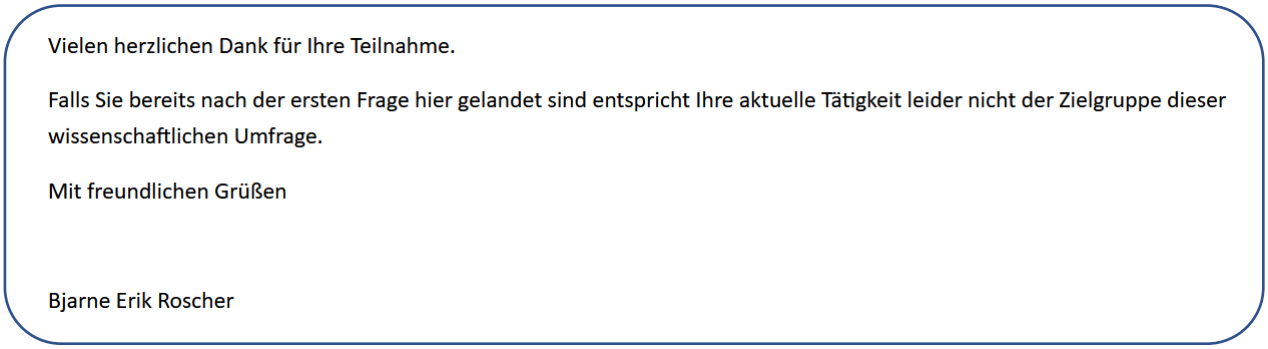


Table shows the different sorting of questions in version 1 and 2.

Question Headline in German language:	**Question Number in Version 1**	**Question Number in Version 2**
Welche Aussage trifft aktuell auf Sie zu:	1	1
In welcher Industrie ist Ihre Firma aktiv?	2	2
Was beschreibt die Firma, für die Sie als IT Leiter verantwortlich sind am besten?	3	3
Welche generelle Einstellung hat das Top-Management Ihres Unternehmens zu ...	8	4
Wie gut beschreiben die folgenden Aussagen Ihre Persönlichkeit als IT Leiter?	22	5
Wenn Ihr Geschäftsführer (CEO) die Hierarchie stufe 0 hat. Wo befinden Sie sich dann im Verhältnis?	23	6
Sind Sie Mitglied im Leitungskreis (Top Management Team) Ihres Unternehmens?	24	7
Welche Organisationsform beschreibt die Einbindung der IT in das Gesamtunternehmen am besten?	27	8
Ausgestaltung der Hierarchie der IT Abteilung	28	9
Wie wird Ihr IT-Bereich betrachtet? (Fin.)	29	10
Wie würden Sie die Ausrichtung Ihrer IT beschreiben? (Zent.)	30	11
Wie würden Sie Ihre IT Architektur im jetzigen Zustand beschreiben:	18	12
Werden Sie und Ihre Organisation an vorher definierten Metriken gemessen?	51	13
Bitte beantworten Sie folgende Fragen zum Beitrag der IT am Unternehmenserfolg:	46	14
Bitte beantworten Sie folgende Fragen:	38	15
Und jetzt bitte noch ein paar Fragen zu Ihrer Zufriedenheit und Motivation in Ihrem aktuellen Job.	39	16
Business IT Alignment	40	17

Wie viele Arbeitstage pro Jahr verwenden Sie, um sich mit strategischen Fragen und Aufgaben zu befassen?	41	18
An wie vielen Arbeitstagen im Jahr sprechen Sie direkt mit Ihrer Führungskraft über den Inhalt ihrer Aufgabe (z.B. Jour Fix, Eskalation Meeting, etc.)	42	19
Alle wie viele Monate überprüfen Sie die strategische IT-Planung Ihres Unternehmens?	43	20
Wie häufig werden IT Themen im Leitungskreis Meetings (Top Management Team) behandelt?	44	21
In welchem Umfang gehören nachfolgende Aufgaben zum Auftrag der IT in Ihrem Unternehmen?	45	22
Wenn Sie von Ihrer Führungskraft gebeten werden einen radikalen, langjährigen Umbau der IT Architektur vorzunehmen sehen Sie das eher als:	19	23
Die Gestaltung meiner Gehaltsbestandteile sind ausreichend, um einen radikalen, langjährigen, Umbau der IT Architektur zu beginnen?	21	24
Welcher variable Gehaltsbestandteil würde Sie am ehesten dazu bewegen einen radikalen, langjährigen Umbau Ihrer IT Architektur voranzutreiben? (z.B. neues ERP, Konsolidierung mehrerer Systeme, Cloud, Outsourcing, etc.)	20	25
Bitte bewerten Sie wie gut die Abstimmung zwischen Ihnen und Ihrer Führungskraft ist.	47	26
Bitte beantworten Sie folgende Fragen bezüglich Ihres Vertrauens und der Loyalität gegenüber Ihrer Führungskraft.	49	27
Beziehung zwischen Ihnen und Ihrer Führungskraft:	48	28
Bitte beantworten Sie einige Fragen zu Ihrer Karriere	33	29
Waren Sie vor Ihrer aktuellen Tätigkeit im gleichen oder in einem anderen Unternehmen tätig?	34	30
Meine letzte Aufgabe beinhaltete:	35	31
In welchen anderen Geschäftsprozessen haben Sie vor der IT schon gearbeitet?	36	32
Wie wurden Sie für ihre aktuelle Stelle gefunden:	37	33
Für welche der folgenden Funktionen sind Sie neben Ihrer IT Tätigkeit im Unternehmen verantwortlich?	9	34
Welche Job-Titel / Amtsbezeichnungen führen Sie in Ihrem Unternehmen?	10	35
Welchen beruflichen Bildungsabschluss haben Sie?	11	36
In welchem Fach haben Sie studiert?	12	37
In welcher Beschäftigungsform arbeiten Sie (überwiegend)?	13	38
Bitte bewerten Sie Ihre Fähigkeiten!	31	39
Bitte beurteilen Sie Ihre Kompetenzen.	32	40
Welche der folgenden Aussagen beschreibt Ihre IT Organisation am besten:	50	41
Wie wird sich Ihr um COVID-19 (Corona) Effekte bereinigtes Budget im Jahr 2022 im Vergleich zum Vorjahr entwickeln?	52	42
Wenn Sie durch Effizienzmaßnahmen in der IT Budget-Mittel einsparen, dann nutzen Sie diese:		43
Bitte geben Sie eine Abschätzung… (% Fixgehalt)	17	44
Sortieren Sie bitte Ihre Einkommensbestandteile absteigend.	16	45
Nun möchte ich Sie bitten mir einen quantitatvien Überblick über ihre Arbeit zu geben.	26	46
Welches Geschlecht haben Sie?	4	47
Wie alt sind Sie?	5	48
In welchem Land arbeiten Sie derzeit?	6	49
In welchem Bundesland befindet sich Ihr Arbeitsplatz?	7	50
Outsourcing	54	51
Wie hoch ist der Anteil an: (Cloud)	55	52

Bitte entscheiden Sie was Sie am ehesten antreibt?	56	53
Optionale Informationen – Einordnung Ihrer Firma.	25	54
Optionale Angaben: Wie hoch ist ungefähr Ihr jährliches Bruttoeinkommen?	15	55
Optionale Angaben: Ich plane die nächste Berufliche Veränderung:	14	56
Möchten Sie an dem Gewinnspiel teilnehmen? Ihre e-mail Adresse wird getrennt von allen vorher erhobenen Angaben gespeichert. Es gibt keinerlei Hinweise auf den Inhalt Ihrer Antworten aus dem Fragebogen	57	57

The following questions are sorted according to questionnaire version 2.

2. In welcher Industrie ist Ihre Firma aktiv?

Wählen Sie bitte bis zu 2 Antworten.

- [ ] Automobilindustrie & Zulieferer
- [ ] Beratung/Consulting
- [ ] Chemieindustrie
- [ ] Pharmazeutische Industrie
- [ ] BIO Branche
- [ ] Energiewirtschaft
- [ ] Bank
- [ ] Finanz Dienstleister
- [ ] Versicherung
- [ ] Einzelhandel
- [ ] Logistik & Transport
- [ ] Elektronik und Elektrotechnik
- [ ] IT und IT-Dienstleistungen
- [ ] Telekommunikation
- [ ] Konsumgüter
- [ ] Private Dienstleistungen
- [ ] Luft- und Raumfahrt
- [ ] Maschinenbau, Betriebstechnik
- [ ] Medizintechnik
- [ ] Druck- und Verlagswesen
- [ ] Freizeit und Tourismus
- [ ] Medien und Unterhaltung
- [ ] Bildungswesen
- [ ] Forschung
- [ ] Gesundheitswesen
- [ ] Öffentlicher Dienst
- [ ] Sozialwesen
- [ ] Holdings
- [ ] Erdöl und Bergbau
- [ ] Agrar
- [ ] sonstige

3. Was beschreibt die Firma, für die Sie als IT Leiter verantwortlich sind am besten?
[Bitte auswählen]

Konzern
Holding
Headquarter (Firmenzentrale)
Produktionseinheit oder -standort
Regionale Einheit (Inland)
Landes Organisation (Ausland)
Service Organisation
Verkaufsorganisation (Retail)
Andere:

4. Welche generelle Einstellung hat das Top-Management Ihres Unternehmens zu ...	extrem negativ	sehr negativ	eher negativ	neutral	eher positiv	sehr positiv	extrem positiv
Forschung und Entwicklung?	○	○	○	○	○	○	○
Technische Innovationen?	○	○	○	○	○	○	○
Geschäftsmodell Innovationen?	○	○	○	○	○	○	○
Prozess Innovationen?	○	○	○	○	○	○	○
Technologieführerschaft?	○	○	○	○	○	○	○
Kostenführerschaft?	○	○	○	○	○	○	○
Qualitätsfüherschaft?	○	○	○	○	○	○	○

5. Wie gut beschreiben die folgenden Aussagen Ihre Persönlichkeit als IT Leiter?	trifft überhaupt nicht zu	trifft eher nicht zu	weder noch	eher zutreffend	trifft voll und ganz zu	kann ich nicht beurteilen
Ich bin eher zurückhaltend, reserviert.	○	○	○	○	○	○
Ich schenke anderen leicht Vertrauen, glaube an das Gute im Menschen.	○	○	○	○	○	○
Ich bin bequem, neige zur Faulheit.	○	○	○	○	○	○
Ich bin entspannt, lasse mich durch Stress nicht aus der Ruhe bringen.	○	○	○	○	○	○
Ich habe nur wenig künstlerisches Interesse.	○	○	○	○	○	○
Ich gehe aus mir heraus, bin gesellig.	○	○	○	○	○	○
Ich neige dazu, andere zu kritisieren.	○	○	○	○	○	○
Ich erledige Aufgaben gründlich.	○	○	○	○	○	○
Ich werde leicht nervös und unsicher.	○	○	○	○	○	○
Ich habe eine aktive Vorstellungskraft, bin fantasievoll.	○	○	○	○	○	○

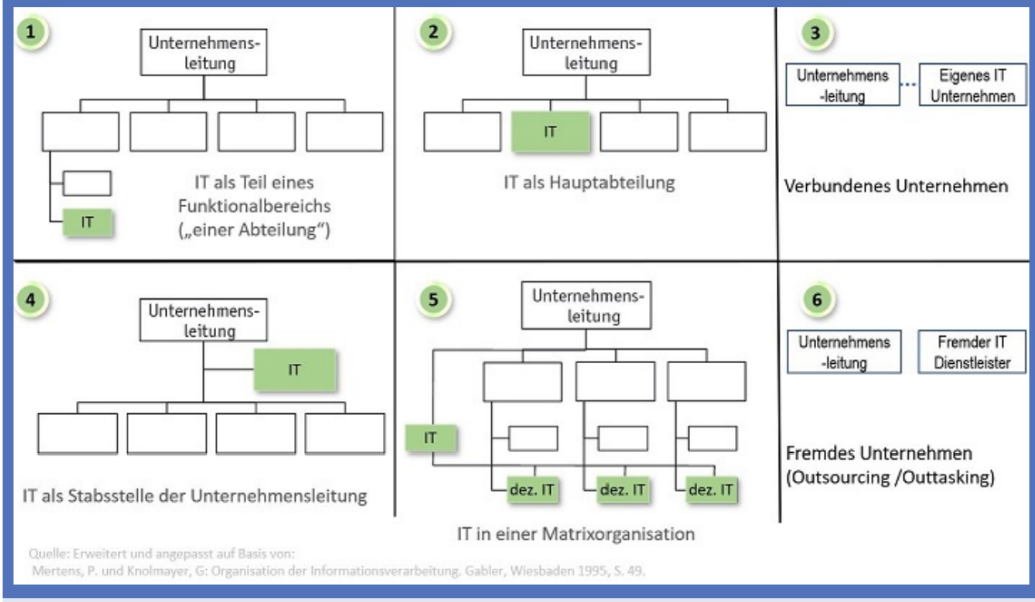
6. Wenn Ihr Geschäftsführer (CEO) die Hierarchiestufe 0 hat. Wo befinden Sie sich dann im Verhältnis?

- ◯ Level 0 – Gleiche Ebene (z.B. IT Geschäftsführer)
- ◯ Level -1 – eine Ebene darunter (Berichtend an den Geschäftsführer (CEO))
- ◯ Level -1 – eine Ebene darunter (Berichtend an den CFO)
- ◯ Level -2 – zwei Ebenen darunter (Berichtend an den CFO)
- ◯ Level -2 – zwei Ebenen darunter (Berichtend an:)
- ◯ Level -3 – zwei Ebenen darunter (Berichtend an:)

7. Sind Sie Mitglied im Leitungskreis (Top Management Team) Ihres Unternehmens?

- ◯ Ja, immer
- ◯ Ja, an definierten Terminen
- ◯ Nein, nur auf Einladung
- ◯ Nein, nur bei Eskalationen
- ◯ Nie
- ◯ Anderes:

8. Welche Organisationsform beschreibt die Einbindung der IT in das Gesamtunternehmen am besten?



Quelle: Erweitert und angepasst auf Basis von:
Mertens, P. und Knolmayer, G: Organisation der Informationsverarbeitung. Gabler, Wiesbaden 1995, S. 49.

- ☐ 1) IT als Teil eines Funktionalbereichs
- ☐ 2) IT als Hauptabteilung
- ☐ 3) IT als Verbundenes Unternehmen (evt. Organschaft)
- ☐ 4) IT als Stabsstelle der Unternehmensleitung
- ☐ 5) IT in einer Matrixorganisation (z.B. im Konzern)
- ☐ 6) Fremdes Unternehmen (Outsourcing aller Bereiche)
- ☐ Andere oder Mischformen

9. Ausgestaltung der Hierarchie der IT Abteilung							
	1	2	3	4	5	6	7
Wie viele Hierarchieebenen hat Ihre IT-Abteilung?	○	○	○	○	○	○	○
Wie viele IT-Abteilungsleiter berichten direkt an Sie?	○	○	○	○	○	○	○

10. Wie wird Ihr IT-Bereich betrachtet?

- ○ Shared Service Center
- ○ Cost Center mit Verrechnung
- ○ Cost Center mit teilweiser Verrechnung
- ○ Cost Center ohne Verrechnung
- ○ Profit Center
- ○ Kammeralistik
- ○ anderes
- ○ k.A.

11. Wie würden Sie die Ausrichtung Ihrer IT beschreiben?						
	weitgehend zentral	eher zentral	Weder noch	eher dezentral	weitgehend dezentral	k.A.
Wie ist Ihr IT Bereich organisiert?	○	○	○	○	○	○

12. Wie würden Sie Ihre IT Architektur im jetztigen Zustand beschreiben:	gar nicht … voll und ganz				
	0	1	2	3	4
modern	○	○	○	○	○
zweckdienlich	○	○	○	○	○
zukunftssicher	○	○	○	○	○
standardisiert	○	○	○	○	○

13. Werden Sie und Ihre Organisation an vorher definierten Metriken gemessen?

IT Service Management (z.B. ITIL) Prozesse

nein	teilweise	ja	*k.A.*

Projektmanagement

nein	teilweise	ja	*k.A.*

Finanzielle KPIs des IT Bereichs

nein	teilweise	ja	*k.A.*

IT Kundenzufriedenheit

nein	teilweise	ja	*k.A.*

14. Bitte beantworten Sie folgende Fragen zum Beitrag der IT am Unternehmenserfolg:

	gar nicht … sehr hoch 0 1 2 3 4
Wie schätzen Sie den Erfolg Ihrer Firma ein?	○ ○ ○ ○ ○
In welchem Maße trägt die IT Organisation zum Erfolg bei?	○ ○ ○ ○ ○
In welchem Maße trage Sie als CIO/IT Leitung dazu bei?	○ ○ ○ ○ ○

15. Bitte beantworten Sie folgende Fragen:	stimme absolut nicht zu / stimme voll und ganz zu 0 1 2 3 4 5
Das Bezahlungssystem meiner Firma fördert die Motivation unserer Mitarbeiter.	○ ○ ○ ○ ○ ○
Meine Bezahlung ist abhängig davon, wie gut ich meinen Job erledige.	○ ○ ○ ○ ○ ○
Gehaltserhöhungen in meinem Umfeld sind oft nicht Leistungsabhängig.	○ ○ ○ ○ ○ ○
Mitarbeiter, die besonders viel leisten, werden immer mit Gehaltsteigerungen belohnt, die größer sind als die von normal Leistern.	○ ○ ○ ○ ○ ○
Gespräche zur Durchsprache von Leistung und Ergebnis helfen mir mich zu verbessern.	○ ○ ○ ○ ○ ○
Die Bewertung durch meinen Vorgesetzten gibt mir Feedback, welches mir oft dabei hilft, meine Leistung zu steigern.	○ ○ ○ ○ ○ ○
Meine letzte Leistungsbewertung hat meine tatsächliche Leistung korrekt dargestellt.	○ ○ ○ ○ ○ ○
Mein Vorgesetzter weiß nicht genug über das was ich verantworte Bescheid, um meine Leistung korrekt zu bewerten.	○ ○ ○ ○ ○ ○
Mein direkter Vorgesetzter arbeitet mit mir, um Leistungsziele und andere Ziele festzulegen.	○ ○ ○ ○ ○ ○
Meine Führungskraft ist in der Lage unterschiedliche Niveaus von Mitarbeiterleistung zu bestimmen.	○ ○ ○ ○ ○ ○

16. Und jetzt bitte noch ein paar Fragen zu Ihrer Zufriedenheit und Motivation in Ihrem aktuellen Job.	stimme absolut nicht zu / stimme voll und ganz zu 0 1 2 3 4 5
Ich erledige wertvolle Arbeit.	○ ○ ○ ○ ○ ○
Die Moral in meinem Arbeitsumfeld ist hoch.	○ ○ ○ ○ ○ ○
Ich bin motiviert schnell auf Kunden und Kollegenanfragen zu reagieren.	○ ○ ○ ○ ○ ○
Mein Team ist sehr engagiert.	○ ○ ○ ○ ○ ○
Ich mag meine Aufgabe und Arbeit.	○ ○ ○ ○ ○ ○
Ich würde meinen Arbeitgeber meiner Familie und meinen Freunden empfehlen.	○ ○ ○ ○ ○ ○
Mein Arbeitgeber ist ein guter Ort, um zu arbeiten.	○ ○ ○ ○ ○ ○
Wegen Unzufriedenheit im Job werde ich wahrscheinlich innerhalb von 12 Monaten eine neue Position oder einen neuen Arbeitgeber suchen.	○ ○ ○ ○ ○ ○
In meinem direkten Umfeld gibt es viele Veränderungen (Rente, Kündigungen, Versetzungen, etc.).	○ ○ ○ ○ ○ ○

17. Business IT Alignment	gar nicht 0 1 2 3 4 sehr gut
Wie bewerten Sie das generelle IT Verständnis ihrer Führungskraft?	○ ○ ○ ○ ○
Wie bewerten Sie generell das IT Verständnis ihrer übrigen Kollegen im Leitungskreis (Top Management Team)?	○ ○ ○ ○ ○
Wie Intensiv stimmen Sie die IT Strategie mit der Unternehmensstrategie ab?	○ ○ ○ ○ ○
Wie stark sind sie als IT-LeiterIn/CIO in die Entwicklung der Unternehmensstrategie eingebunden?	○ ○ ○ ○ ○
In welchem Umfang unterstützt die Unternehmens-IT aus Ihrer Sicht die Geschäftsstrategie des Unternehmens?	○ ○ ○ ○ ○

18. Wie viele Arbeitstage pro Jahr verwenden Sie, um sich mit strategischen Fragen und Aufgaben zu befassen?
An ☐ Tagen

19. An wie vielen Arbeitstagen im Jahr sprechen Sie direkt mit Ihrer Führungskraft über den Inhalt ihrer Aufgabe (z.B. Jour Fix, Eskalations Meeting, etc.)
An ☐ Tagen pro Jahr

20. Alle wie viele Monate überprüfen Sie die strategische IT-Planung Ihres Unternehmens?
Alle ☐ Monate

21. Wie häufig werden IT Themen im Leitungskreis Meetings (Top Management Team) behandelt?	gar nicht 0 1 2 3 4 immer
Initiiert durch mich selbst	○ ○ ○ ○ ○
Initiiert durch einen Kollegen des Leitungskreises	○ ○ ○ ○ ○
Initiiert durch die Geschäftsleitung	○ ○ ○ ○ ○
Bedingt durch Störungen und Probleme	○ ○ ○ ○ ○

22. In welchem Umfang gehören nachfolgende Aufgaben zum Auftrag der IT in Ihrem Unternehmen?	gar nicht … vollständig 0 1 2 3 4
Die IT standardisieren, integrieren und konsolidieren	○ ○ ○ ○ ○
Die IT-gestützte Interaktion und Kommunikation verbessern	○ ○ ○ ○ ○
Den IT-Betrieb rationalisieren und optimieren	○ ○ ○ ○ ○
Durch IT-Einsatz neue fachliche Möglichkeiten schaffen	○ ○ ○ ○ ○
Die IT-Durchdringung im Unternehmen steigern	○ ○ ○ ○ ○
Die Komplexität fachlicher Prozesse reduzieren	○ ○ ○ ○ ○
Das Erfassen, Aufbereiten und Nutzen von Echtzeitdaten ermöglichen	○ ○ ○ ○ ○
Technologische Innovationen entwickeln	○ ○ ○ ○ ○
Neue Produkte, Märkte und Geschäftsmodelle entwickeln	○ ○ ○ ○ ○
Neue Umsatzquellen für das Unternehmen erschließen	○ ○ ○ ○ ○

23. Wenn Sie von Ihrer Führungskraft gebeten werden einen radikalen, langjährigenn Umbau der IT Architektur vorzunehmen sehen Sie das eher als:	gar nicht … voll und ganz 0 1 2 3 4 5 6
Risiko?	○ ○ ○ ○ ○ ○ ○
Chance?	○ ○ ○ ○ ○ ○ ○
Bedrohung?	○ ○ ○ ○ ○ ○ ○

24. Die Gestaltung meiner Gehaltsbestandteile sind ausreichend, um einen radikalen, langjährigen, Umbau der IT Architektur zu beginnen?	stimme gar nicht zu … stimme voll zu 0 1 2 3 4
In Bezug auf die Höhe des variablen Gehaltsbestandteiles.	○ ○ ○ ○ ○
In Bezug auf die Langfristigkeit des variablen Gehaltsbestandteils.	○ ○ ○ ○ ○

25. Welcher variable Gehaltsbestandteil würde Sie am ehesten dazu bewegen einen radikalen, langjährigen Umbau Ihrer IT Architektur voranzutreiben? (z.B. neues ERP, Konsolidierung mehrerer Systeme, Cloud, Outscourcing, etc.)

- ☐ Variables Einkommen basierend auf eigenen Zielen
- ☐ Variables Gehalt basierend auf jährlichen Firmen Zielen (Gewinn, Umsatz, Marge, EBIT, etc.)
- ☐ Aktien
- ☐ Aktien Optionen
- ☐ Retention Bonus (Bleibe Bonus)
- ☐ Projekt Bonus
- ☐ Langfristiger (>1 Jahr) Bonus auf basis von Firmen Performance
- ☐ Firmenfahrzeug
- ☐ Mobilitätszulage
- ☐ andere nicht-monitäre Zuwendungen
- ☐ andere:

26. Bitte bewerten Sie wie gut die Abstimmung zwischen Ihnen und Ihrer Führungskraft ist.

	nicht vorhanden 0	1	2	3	sehr gut 4
Business IT Alignment	○	○	○	○	○
IT Strategie & IT Architektur	○	○	○	○	○
IT Projektportfolio und Roadmap	○	○	○	○	○
IT Innovationen und Trends für Ihre Firma	○	○	○	○	○
Proaktivität ihres Handelns	○	○	○	○	○
Risikobereitschaft	○	○	○	○	○

27. Bitte beantworten Sie folgende Fragen bezüglich Ihres Vertrauens und der Loyalität gegenüber Ihrer Führungskraft.

	Stimme überhaupt nicht zu 0	1	2	3	Stimme voll zu 4
Ich bin sehr zuversichtlich, dass mich meine Führungskraft immer fair behandeln wird.	○	○	○	○	○
Meine Führungskraft würde nie versuchen, einen Vorteil zu erlangen, indem sie Mitarbeitende täuscht.	○	○	○	○	○
Ich habe vollstes Vertrauen in die Integrität meiner Führungskraft.	○	○	○	○	○
Ich empfinde eine starke Loyalität gegenüber meiner Führungskraft.	○	○	○	○	○
Ich würde meine Führungskraft in fast jeder Notsituation unterstützen.	○	○	○	○	○
Ich habe ein gespaltenes Loyalitätsverhältnis zu meiner Führungskraft.	○	○	○	○	○

28. Beziehung zwischen Ihnen und Ihrer Führungskraft:

Wenn Sie sich nicht sicher sind schätzen Sie oder lassen Sie das Feld frei.

Wie lange kennen Sie sich bereits?	☐ Jahre
Wie lange ist ihre Führungskraft ihr Chef?	☐ Jahre

29. Bitte beantworten Sie einige Fragen zu Ihrer Karriere

Wie viele Jahre haben Sie in Ihrem Leben in der IT gearbeitet?	☐ Jahre
Wie viele Jahre haben Sie insgesamt Erfahrung als CIO/IT Leiter.	☐ Jahre
Wie viele Jahre arbeiten Sie in der jetzigen Funtion als CIO/IT Verantwortlicher?	☐ Jahre

30. Waren Sie vor Ihrer aktuellen Tätigkeit im gleichen oder in einem anderen Unternehmen tätig?

- ◯ gleiches Unternehmen
- ◯ anderes Unternehmen
- ◯ keine Angabe

31. Meine letzte Aufgabe beinhaltete:

- ☐ IT Aufgaben
- ☐ Führungsverantwortung

32. In welchen anderen Geschäftsprozessen haben Sie vor der IT schon gearbeitet?

- ☐ PLM (Forschung & Entwicklung)
- ☐ SCM (Produktion & Logistik)
- ☐ CRM (Marketing und Vertrieb)
- ☐ Support Prozesse (Einkauf, IT, HR, Facility Management etc.)
- ☐ Management Prozesse (Quality, Compliance, Controlling, Strategy planning etc.)
- ☐ Business Consulting
- ☐ IT Consulting
- ☐ Keiner
- ☐ Andere:

33. Wie wurden Sie für ihre aktuelle Stelle gefunden:

- [ ] Ausschreibung (Stellenanzeige)
- [ ] Empfehlung durch frühere Führungskraft
- [ ] Empfehlung durch Kollegen / Bekannte
- [ ] Headhunter
- [ ] Nachfolgeregelung im Unternehmen
- [ ] Weiterentwicklung im Unternehmen
- [ ] Job Rotation im Unternehmen
- [ ] andere

34. Für welche der folgenden Funktionen sind Sie neben Ihrer IT Tätigkeit im Unternehmen verantwortlich?

Mehrfachnennungen sind möglich.

- [ ] CEO (Geschäftsführer)
- [ ] CFO (kaufmännischer Geschäftsführer)
- [ ] CDO (Digitalisierungs Verantwortlicher)
- [ ] Informations Sicherheits Beauftragter (CISO)
- [ ] Datenschutzbeauftragter
- [ ] Buchhaltung / Rechnungswesen / Controlling / Personal / Verwaltung
- [ ] Produktion / Logistik / Einkauf
- [ ] Entwicklung
- [ ] Marketing/ Vertrieb
- [ ] Qualitätsmanagement
- [ ] Sonstiges:

35. Welche Job-Titel / Amtsbezeichnungen führen Sie in Ihrem Unternehmen?

- [ ] LeiterIn IT
- [ ] CIO (Chief Information Officer)
- [ ] Geschäftsführung IT
- [ ] Bereichsleitung IT
- [ ] Director IT
- [ ] Head of IT
- [ ] Abteilungsleitung IT
- [ ] Vorstand IT
- [ ] IT ManagerIn
- [ ] Manager
- [ ] Director
- [ ] Vice President
- [ ] President
- [ ] CDO (Chief Digitization Officer)
- [ ] CEO (Chief Executive Officer)
- [ ] CFO (Chief Financial Officer)
- [ ] CTO (Chief Technology Officer)
- [ ] CISO (Chief Information Security Officer)
- [ ] DPO (Data Protection Officer)
- [ ] Andere:

36. Welchen beruflichen Bildungsabschluss haben Sie?

Bitte wählen Sie den höchsten Bildungsabschluss, den Sie bisher erreicht haben.

[Bitte auswählen]

Abgeschlossene Lehre
Meister-, Techniker- oder gleichwertiger Fachschulabschluss
Fachhochschulabschluss / Hochschulabschluss
Universitätsabschluss
Promotion
Anderer Abschluss, und zwar:
nicht beantwortet

37. In welchem Fach haben Sie studiert?

Wählen Sie alle die zutreffen.

- [ ] Wirtschaftswissenschaften
- [ ] Wirtschaftsinformatik
- [ ] Informatik
- [ ] Ingenieurwesen
- [ ] Naturwissenschaften
- [ ] Andere:
- [ ] trifft nicht zu

38. In welcher Beschäftigungsform arbeiten Sie (überwiegend)?

[Bitte auswählen]

Angestellte/r
Beamte/r
Selbstständig (z.B. Interim Manager/in)
Leitender Angestellte/r
Geschäftsführer/in
Andere:

39. Bitte bewerten Sie Ihre Fähigkeiten!

	nicht vorhanden 0	1	2	3	sehr stark ausgeprägt 4
Analytisches Denken	○	○	○	○	○
Strategisches Denken	○	○	○	○	○
Strategisches Handeln	○	○	○	○	○
Veränderungsmanagement	○	○	○	○	○
Innovationsmanagement	○	○	○	○	○
Organisations Tallent	○	○	○	○	○
Kommunikations Talent	○	○	○	○	○
Hands-On Mentalität	○	○	○	○	○
Team player	○	○	○	○	○
Prozess denken	○	○	○	○	○

40. Bitte beurteilen Sie Ihre Kompetenzen.							
	nahezu nicht vorhanden				sehr gut ausgeprägt	nicht vorhanden, hier besteht Handlungs-bedarf	benötige ich nicht
	1	2	3	4	5		
Projekt Management	○	○	○	○	○	○	○
Programm Management	○	○	○	○	○	○	○
Business Management	○	○	○	○	○	○	○
Technologie	○	○	○	○	○	○	○
Problem Lösungskompetenz	○	○	○	○	○	○	○
Beratungskompetenz	○	○	○	○	○	○	○
Coaching Kompetenz	○	○	○	○	○	○	○
IT Prozesse	○	○	○	○	○	○	○
Führungskompetenz	○	○	○	○	○	○	○
Vertrags Management	○	○	○	○	○	○	○
Internationale Führung	○	○	○	○	○	○	○
Verteilte Führung	○	○	○	○	○	○	○

41. Welche der folgenden Aussagen beschreibt Ihre IT Organisation am besten:

Wir haben keine Prozesse (Level 0)

ITIL (IT Service Management)	Projektmanagement

Wir haben gerade angefangen Prozesse einzuführen (Level1)

ITIL (IT Service Management)	Projektmanagement

Wir haben einen relativ niedrigen Prozessreifegrad. Einige Prozesse sind dokumentiert und diese werden verstanden. Fehler sind wahrscheinlich. (Level 2)

ITIL (IT Service Management)	Projektmanagement

Wir haben ein mittlere Prozessreife. Prozesse sind dokumentiert und werden auf Einhaltung überprüft. (Level 3)

ITIL (IT Service Management)	Projektmanagement

Wir haben eine relativ hohe Prozessreife. Unsere Prozesse sind dokumentiert und werden anhand von definierten Metriken gemessen. (Level 4)

ITIL (IT Service Management)	Projektmanagement

Wir haben eine sehr hohe Prozessreife. Unsere Prozesse sind dokumentiert, verstanden, mit Metriken hinterlegt und werden ständig überprüft mit dem Ziel einer Verbesserung (Level 5)

ITIL (IT Service Management)	Projektmanagement

42. Wie wird sich Ihr um COVID-19 (Corona) Effekte bereinigtes Budget im Jahr 2022 im Vergleich zum Vorjahr entwickeln?

- ◯ k.a.
- ◯ bleibt gleich
- ◯ sinkt
- ◯ steigt

43. Wenn Sie durch Effizienzmaßnahmen in der IT Budget-Mittel einsparen, dann nutzen Sie diese:

	gar nicht	teilweise	vollständig
für COVID-19 bedingte IT Maßnahmen	◯	◯	◯
Um die Einsparungen an den CFO/Kaufmann weiterzugeben und den Gewinn zu steigern	◯	◯	◯
Um Redundanzen in der IT Landschaft zu beseitigen	◯	◯	◯
Um die Funktionalität vorhandener Applikationen zu verbessern	◯	◯	◯
Um neue Geschäftsmodelle zu unterstützen	◯	◯	◯
Um unvorhergesehene Anforderungen abzudecken	◯	◯	◯

44. Bitte geben Sie eine Abschätzung...

... wie hoch der Anteil Ihres Fixgehaltes an ihrem Gesamtgehalt pro Jahr ist.

45. Sortieren Sie bitte Ihre Einkommensbestandteile absteigend.

Wobei der sich der größte Anteil oben und der kleinste Anteil (gemessen am Nettogehalt eines Jahres) unten befindet.

Festgehalt	Variables Einkommen basierend auf eigenen Zielen	Variables Gehalt basierend auf jährlichen Firmen Zielen (Gewinn, Umsatz, Marge, EBIT, etc.)	1
			2
			3
Aktien	Aktien Optionen	Retention Bonus (Bleibe Bonus)	4
			5
Projekt Bonus	Langfristiger (>1 Jahr) Bonus auf basis von Firmen Performance	Firmenfahrzeug	6
		Mobilitätszulage	7
andere nichtmonitäre Zuwendungen			8
			9
			10
			11

46. Nun möchte ich Sie bitten mir einen quantitativen Überblick über ihre Arbeit zu geben.

Bitte geben sie qualifizierte Schätzungen ab, wenn Sie keine genauen Zahlen haben!

IT Kosten im % vom Umsatz	
IT Employees	
Managed Clients	

47. Welches Geschlecht haben Sie?

- ◯ weiblich
- ◯ männlich
- ◯ divers

48. Wie alt sind Sie?

[Bitte auswählen]

< 30 Jahre
30 bis 39 Jahre
40 bis 49 Jahre
50 bis 59 Jahre
>= 60 Jahre

49. In welchem Land arbeiten Sie derzeit?

[Bitte auswählen]

Deutschland
Österreich
Schweiz
Italien
Belgien
Frankreich
Luxemburg
Dänemark
Lettland
anderes

50. In welchem Bundesland befindet sich Ihr Arbeitsplatz?

Bitte nur Ausfüllen, wenn Sie in Deutschland beschäftigt sind.

[Bitte auswählen]

Baden-Würtemberg
Bayern
Berlin
Brandenburg
Bremen
Hamburg
Hessen
Mecklenburg-Vorpommern
Niedersachsen
Nordrhein-Westfahlen
Rheinland-Pfalz
Saarland
Sachsen
Sachsen-Anhalt
Schleswig-Holstein
Thüringen
Keines

51. Outsourcing

	gar nicht	vollständig	k.A.
Wie hoch ist Ihr Outsourcing Anteil?	○ ○ ○ ○ ○ ○ ○ ○ ○ ○		○
Wie zufrieden sind Sie im allgemeinen mit dem Outsourcing?	○ ○ ○ ○ ○ ○ ○ ○ ○ ○		○
Wie zufrieden sind Sie mit dem internen Aufwand durch das Outsourcing?	○ ○ ○ ○ ○ ○ ○ ○ ○ ○		○

52. Wie hoch ist der Anteil an:

	0% 100%	k.A.
Cloud Applikationen an Ihrer IT Architektur?	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○
Cloud Dienstleistungen an Ihrem IT Ausgaben?	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○
Agilen Methoden an Ihren IT Prozessen?	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○

53. Bitte entscheiden Sie was Sie am ehesten antreibt?

Arbeit mit Menschen	———	Technische Herausforderung
Spaß durch die Arbeit	———	Befriedigung durch das Gehalt
Aufstiegsmöglichkeiten	———	Selbstverwirklichung
Blick auf das große Ganze	———	Perfekte Lösungen für den Kunden

Gleich geschafft - das sind die letzten Fragen!

Die folgenden Fragen fallen für einige von Ihnen eventuell unter das Stichwort "Vertraulich".

Daher ist die Beantwortung freiwillig.

Sie können den Fragebogen auch abschließen ohne diese zu beantworten!

54. Optionale Informationen – Einordnung Ihrer Firma.

Wenn Sie die genauen Werte nicht wissen, schätzen Sie bitte. Wenn Sie keine Angabe zu einzelnen Feldern machen wollen können Sie diese frei lassen.

Die Firma beschäftigt insgesamt [ ] Mitarbeiter (FTE).

Die Firma macht einen jährlichen Umsatz von [ ] Mio €.

Die Firma erzielt einen Gewinn von [ ] Mio €/a (EBIT)

Die Firma ist in [ ] Ländern aktiv.

Die Firma hat [ ] Standorte.

55. Optionale Angaben: Wie hoch ist ungefähr Ihr jährliches Bruttoeinkommen?

Gemeint ist der Betrag, welchen Sie für die Tätigkeit als IT Manager, Leiter IT oder CIO erhalten (vor Abzug der Steuern und Sozialversicherungen).

[Bitte auswählen]

56. Optionale Angaben: Ich plane die nächste Berufliche Veränderung:

○ Ich gehe in Ruhestand: Bitte Jahre eingeben

○ Nächste Karrierestufe: Bitte Jahre eingeben

○ keine.

57. Möchten Sie an dem Gewinnspiel teilnehmen? Ihre e-mail Adresse wird getrennt von allen vorher erhobenen Angaben gespeichert. Es gibt keinerlei Hinweise auf den Inhalt Ihrer Antworten aus dem Fragebogen

☒ Ich will am **Gewinnspiel** teilnehmen. Ich willige ein, dass meine E-Mail-Adresse bis zur Ziehung der Gewinner gespeichert wird. Diese Einwilligung kann ich jederzeit widerrufen. Meine Angaben in dieser Befragung bleiben weiterhin anonym, meine E-Mail-Adresse wird nicht an Dritte weitergegeben.

☒ Ich interessiere mich für die **Ergebnisse dieser Studie** und hätte gerne eine Zusammenfassung per E-Mail.

E-Mail-Adresse:	

Appendix L: English translation of relevant questions used in the research

The questions can also be found in chapter 3.2 Measurement Constructs – description of the variables.

PAM

They were measured on a 5-point Likert scale rating from 1: not available to 5: very good.

7. Indicate how you rate the alignment between you and your Manager in regard to Business IT Alignment. (PA01_09)
8. Indicate how you rate the alignment between you and your Manager in regard to IT Strategy and IT Architecture. (PA01_01)
9. Indicate how you rate the alignment between you and your Manager in regard to IT Project portfolio and Roadmap. (PA01_02)
10. Indicate how you rate the alignment between you and your Manager in regard to IT Innovations and trends for your company. (PA01_04)
11. Indicate how you rate the alignment between you and your Manager in regard to proactiveness of your actions. (PA01_05)
12. Indicate how you rate the alignment between you and your Manager in regard to your willingness to take risk. (PA01_06)

BITA

The items are measured on a five-point Likert scale rating from 1: not at all to 6: very good.

4. How intensely do you align the IT Strategy with the company strategy? (ST01_02)
5. How strong are you as the IT Manager / CIO involved in the design of the company strategy? (ST01_03)
6. According to your view, rate to which extent does the company-IT support the strategy of the company? (ST01_04)

PMS

six-point Likert scale rating from 1: don’t agree to 6: agree fully.

6. Performance appraisal discussions are useful in helping me improve my performance. (*MS01_05)*
7. My supervisor’s evaluation provides feedback that often helps me improve my job performance. (*MS01_06)*

8. My most recent performance rating accurately reflected my performance. (*MS01_07)*
9. My immediate supervisor works with me to set performance goals and targets. (*MS01_09)*
10. My supervisor is able to accurately determine different levels of employee performance. (*MS01_10)*

MIS

six-point Likert scale rating from 1: don't agree to 6: agree fully.

5. The pay-for-performance system of my company promotes the motivation of our employees. (MS01_01)
6. My pay is based on how well I do my job. (MS01_02)
7. Pay raises in my work unit often are not really related to performance (Reversed). (MS01_03_rec)
8. High-performing employees in my work unit consistently are rewarded with pay increases greater than those awarded to average performing employees. MS01_04

WM

The four indicators of this reflective scale are measured on a six-point Likert answer scale spanning from 1: don't agree to 6: agree fully.

5. I am doing work that is worthwhile (MS02_01)
6. Morale is high in my work unit (MS02_02)
7. I am motivated to respond swiftly to questions of customers and colleagues. (MS02_03)
8. My team is very engaged. (MS02_04)

JS

The three indicators of this reflective scale are measured on a six-point Likert answer scale spanning from 1: don't agree to 6: fully agree.

4. I like my job. (MS02_05)
5. I would recommend my employer to family members and friends. (MS02_06)
6. My employer is a good place to work. (MS02_07)

PAT

The three indicators of this reflective scale are measured on a five-point Likert answer scale spanning from 1: don't agree to 5: fully agree.

4. I feel quite confident that my leader will always try to treat me fairly. (PA13_01)
5. My manager would never try to gain an advantage by deceiving workers. (PA13_02)
6. I have complete faith in the integrity of my manager/supervisor. (PA13_03)

PIK

Both indicators of this reflective scale are measured on a five-point Likert scale rating from 1: not at all to 5: very good.

3. How do you rate the general IT understanding of your manager/supervisor? (*ST01_06)*
4. How do you rate the IT understanding of the remaining colleagues in the Top Management Team? (*ST01_05)*

KUS

Answers (A) for each question could be no =0, partly =1, and yes =2.

Are you and your organization measured according to predefined metrics?

5. IT Service Management (MO04_01)
6. Project Management (MO04_02)
7. Financial KPIs of the IT Department (MO04_03)
8. IT Customer Satisfaction(MO04_04)

Effec

The items are measured on a five-point Likert scale rating from 1: not at all to 5: completely.

A: Innovative orientation of IT "Pioneer" / support of new business models

Questions:

4. Develop technological innovations (IM01_08)
5. Acquire new sources of turnover for the company (IM01_10)
6. Develop new products, markets, and business models (IM01_09)

B: Improvement of Business Processes "Effectivity"

Questions:

6. Optimize the IT-based interaction and communication (IM01_02)
7. Enable new professional opportunities by using IT (IM01_04)
8. Increase IT penetration in the Company (IM01_05)
9. Reduce the complexity of business processes (IM01_06)
10. Enable the capturing, processing, and usage of real-time data (IM01_07)

C: standardization, rationalization, and consolidation. “Support”:

Questions:

3. Standardization, integration, and consolidation of IT(IM01_01)
4. Rationalize and optimize the IT operation (IM01_03)

LS

How many IT Department Heads are directly reporting to you? (OR02_03)

Appendix M: SPSS calculation method of covariable Effec

```
FREQUENCIES IM01_01 IM01_02 IM01_03 IM01_04 IM01_05 IM01_06
IM01_07 IM01_08 IM01_09 IM01_10.


FACTOR
  /VARIABLES IM01_01 IM01_02 IM01_03 IM01_04 IM01_05 IM01_06
IM01_07 IM01_08 IM01_09 IM01_10
  /MISSING LISTWISE
  /ANALYSIS IM01_01 IM01_02 IM01_03 IM01_04 IM01_05 IM01_06
IM01_07 IM01_08 IM01_09 IM01_10
  /PRINT INITIAL EXTRACTION ROTATION
  /FORMAT SORT BLANK(.10)
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25) DELTA(0)
  /ROTATION OBLIMIN
  /METHOD=CORRELATION.


* Item exclusion based on both EFA results and content.



FACTOR
  /VARIABLES IM01_01 IM01_03 IM01_04 IM01_05 IM01_06 IM01_07
  /MISSING LISTWISE
  /ANALYSIS IM01_01 IM01_03 IM01_04 IM01_05 IM01_06 IM01_07
  /PRINT INITIAL EXTRACTION ROTATION
  /FORMAT SORT BLANK(.10)
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25) DELTA(0)
  /ROTATION OBLIMIN
  /METHOD=CORRELATION.


RELIABILITY
  /VARIABLES=  IM01_01 IM01_03
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.


* Factor efficiency is not formed firstly because of bad alpha,
secondly the variables are extremely skewed (all CIOs are doing that)
-> there is hardly any scattering.


RELIABILITY
  /VARIABLES=  IM01_04 IM01_05 IM01_06 IM01_07
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

```
COMPUTE Effec = MEAN.3( IM01_04, IM01_05, IM01_06, IM01_07).
EXECUTE.
VALUE LABELS  Effec
1 'gar nicht'
5 'vollständig'.
```

The detailed results are directly taken from SPSS and do therefore not comply with the format of the rest of this research.

Frequency table

Statistics

		IM01_01 Standardize, integrate and consolidate IT	IM01_02 Optimize the it based interaction and communication	IM01_03 Optimize and rationalize the IT operations	IM01_04 Enable new professional opportunities by using IT	IM01_05 Increase IT penetration in the Company	IM01_06 Reduce the complexity of business processes	IM01_07 Enable the capturing, processing and usage of real-time data	IM01_08 Develop technological innovations	IM01_09 Develop new products, markets and business models	IM01_10 Acquire new sources of turnover for the company
N	Valid	161	162	162	162	162	162	160	162	162	162
	Missing	1	0	0	0	0	0	2	0	0	0

IM01_01 Standardize, integrate and consolidate IT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 [1]	1	.6	.6	.6
	3 [2]	8	4.9	5.0	5.6
	4 [3]	46	28.4	28.6	34.2
	5 vollständig [4]	106	65.4	65.8	100.0
	Total	161	99.4	100.0	
Missing	-9 nicht beantwortet	1	.6		
Total		162	100.0		

IM01_02 Optimize the it based interaction and communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 gar nicht [0]	1	.6	.6	.6
	2 [1]	4	2.5	2.5	3.1
	3 [2]	3	1.9	1.9	4.9
	4 [3]	59	36.4	36.4	41.4
	5 vollständig [4]	95	58.6	58.6	100.0
	Total	162	100.0	100.0	

IM01_03 Optimize and rationalize the IT operations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 [1]	6	3.7	3.7	3.7
	3 [2]	19	11.7	11.7	15.4
	4 [3]	46	28.4	28.4	43.8
	5 vollständig [4]	91	56.2	56.2	100.0
	Total	162	100.0	100.0	

IM01_04 Enable new professional opportunities by using IT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 [1]	8	4.9	4.9	4.9
	3 [2]	17	10.5	10.5	15.4
	4 [3]	73	45.1	45.1	60.5
	5 vollständig [4]	64	39.5	39.5	100.0
	Total	162	100.0	100.0	

IM01_05 Increase IT penetration in the Company

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 gar nicht [0]	2	1.2	1.2	1.2
	2 [1]	10	6.2	6.2	7.4
	3 [2]	23	14.2	14.2	21.6
	4 [3]	69	42.6	42.6	64.2
	5 vollständig [4]	58	35.8	35.8	100.0
	Total	162	100.0	100.0	

IM01_06 Reduce the complexity of business processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 [1]	12	7.4	7.4	7.4
	3 [2]	36	22.2	22.2	29.6
	4 [3]	57	35.2	35.2	64.8
	5 vollständig [4]	57	35.2	35.2	100.0
	Total	162	100.0	100.0	

IM01_07 Enable the capturing, processing and usage of real-time data

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 gar nicht [0]	3	1.9	1.9	1.9
	2 [1]	30	18.5	18.8	20.6
	3 [2]	44	27.2	27.5	48.1
	4 [3]	44	27.2	27.5	75.6
	5 vollständig [4]	39	24.1	24.4	100.0
	Total	160	98.8	100.0	
Missing	-9 nicht beantwortet	2	1.2		
Total		162	100.0		

IM01_08 Develop technological innovations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 gar nicht [0]	11	6.8	6.8	6.8
	2 [1]	19	11.7	11.7	18.5
	3 [2]	37	22.8	22.8	41.4
	4 [3]	55	34.0	34.0	75.3
	5 vollständig [4]	40	24.7	24.7	100.0
	Total	162	100.0	100.0	

IM01_09 Develop new products, markets and business models

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 gar nicht [0]	32	19.8	19.8	19.8
	2 [1]	49	30.2	30.2	50.0
	3 [2]	44	27.2	27.2	77.2
	4 [3]	22	13.6	13.6	90.7
	5 vollständig [4]	15	9.3	9.3	100.0
	Total	162	100.0	100.0	

IM01_10 Acquire new sources of turnover for the company

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 gar nicht [0]	45	27.8	27.8	27.8
	2 [1]	52	32.1	32.1	59.9
	3 [2]	38	23.5	23.5	83.3
	4 [3]	17	10.5	10.5	93.8
	5 vollständig [4]	10	6.2	6.2	100.0
	Total	162	100.0	100.0	

FIRST FACTOR ANALYSIS

Communalities

	Initial	Extraction
IM01_01 Standardize, integrate and consolidate IT	.235	.238
IM01_02 Optimize the it based interaction and communication	.296	.319
IM01_03 Optimize and rationalize the IT operations	.238	.274
IM01_04 Enable new professional opportunities by using IT	.436	.474
IM01_05 Increase IT penetration in the Company	.368	.403
IM01_06 Reduce the complexity of business processes	.268	.255
IM01_07 Enable the capturing, processing and usage of real-time data	.330	.290
IM01_08 Develop technological innovations	.446	.436
IM01_09 Develop new products, markets and business models	.701	.802
IM01_10 Acquire new sources of turnover for the company	.664	.735

Extraction Method: Principal Axis Factoring.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.485	34.851	34.851	2.977	29.766	29.766	2.518
2	1.770	17.695	52.547	1.249	12.494	42.260	2.111
3	.976	9.760	62.306				
4	.885	8.848	71.154				
5	.764	7.644	78.798				
6	.590	5.897	84.695				
7	.541	5.413	90.108				
8	.444	4.438	94.546				
9	.365	3.645	98.191				
10	.181	1.809	100.000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Factor Matrix[a]

	Factor	
	1	2
IM01_09 Develop new products, markets and business models	.754	-.483
IM01_04 Enable new professional opportunities by using IT	.677	.122
IM01_08 Develop technological innovations	.660	
IM01_10 Acquire new sources of turnover for the company	.655	-.553
IM01_05 Increase IT penetration in the Company	.531	.348
IM01_06 Reduce the complexity of business processes	.503	
IM01_07 Enable the capturing, processing and usage of real-time data	.497	.206
IM01_02 Optimize the it based interaction and communication	.447	.345
IM01_01 Standardize, integrate and consolidate IT	.119	.473
IM01_03 Optimize and rationalize the IT operations	.295	.433

Extraction Method: Principal Axis Factoring.

a. 2 factors extracted. 8 iterations required.

Structure Matrix

	Factor	
	1	2
IM01_09 Develop new products, markets and business models	.895	.191
IM01_10 Acquire new sources of turnover for the company	.846	
IM01_08 Develop technological innovations	.571	.459
IM01_06 Reduce the complexity of business processes	.405	.391
IM01_05 Increase IT penetration in the Company	.276	.621
IM01_04 Enable new professional opportunities by using IT	.518	.565
IM01_02 Optimize the it based interaction and communication	.206	.560
IM01_03 Optimize and rationalize the IT operations		.515
IM01_07 Enable the capturing, processing and usage of real-time data	.320	.497
IM01_01 Standardize, integrate and consolidate IT	-.141	.419

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

Factor Correlation Matrix

Factor	1	2
1	1.000	.241
2	.241	1.000

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

*Item exclusion of IM01_02, IM01_08, IM01_9 and IM01_10 due to the result of the explorative factor analysis and due to professional reasons.

Second factor analysis

Communalities

	Initial	Extraction
IM01_01 Standardize, integrate and consolidate IT	.143	.345
IM01_03 Optimize and rationalize the IT operations	.191	.406
IM01_04 Enable new professional opportunities by using IT	.303	.467
IM01_05 Increase IT penetration in the Company	.297	.416
IM01_06 Reduce the complexity of business processes	.192	.239
IM01_07 Enable the capturing, processing and usage of real-time data	.244	.322

Extraction Method: Principal Axis Factoring.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2.304	38.404	38.404	1.681	28.014	28.014	1.597
2	1.139	18.986	57.389	.515	8.576	36.590	1.013
3	.836	13.938	71.328				
4	.649	10.817	82.144				
5	.590	9.825	91.970				
6	.482	8.030	100.000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Factor Matrix[a]

	Factor	
	1	2
IM01_04 Enable new professional opportunities by using IT	.637	-.248
IM01_05 Increase IT penetration in the Company	.624	-.163
IM01_07 Enable the capturing, processing and usage of real-time data	.561	
IM01_06 Reduce the complexity of business processes	.475	-.118
IM01_03 Optimize and rationalize the IT operations	.474	.426
IM01_01 Standardize, integrate and consolidate IT	.349	.472

Extraction Method: Principal Axis Factoring.

a. 2 factors extracted. 9 iterations required.

Structure Matrix

	Factor	
	1	2
IM01_04 Enable new professional opportunities by using IT	.680	.228
IM01_05 Increase IT penetration in the Company	.645	.284
IM01_07 Enable the capturing, processing and usage of real-time data	.564	.298
IM01_06 Reduce the complexity of business processes	.489	.221
IM01_03 Optimize and rationalize the IT operations	.343	.632
IM01_01 Standardize, integrate and consolidate IT	.210	.585

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

Factor Correlation Matrix

Factor	1	2

1	1.000	.427
2	.427	1.000

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

Reliability

Scale: all variables

Case Processing Summary

		N	%
Cases	Valid	161	99.4
	Excluded[a]	1	.6
	Total	162	100.0

a. Listwise deletion based on all variables in the procedure.

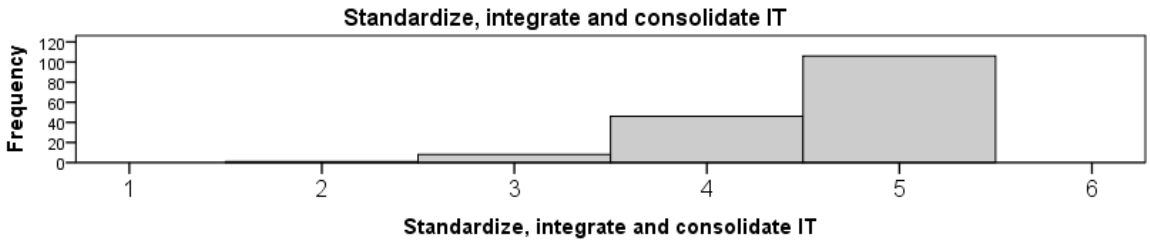
Reliability Statistics

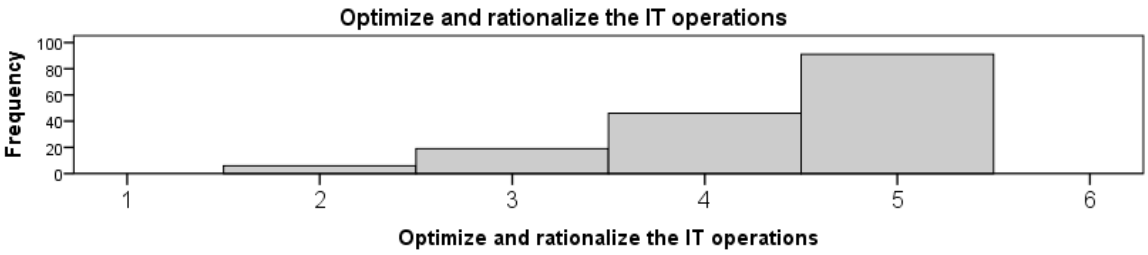
Cronbach's Alpha	N of Items
.506	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
IM01_01 Standardize, integrate and consolidate IT	4.37	.698	.355	.
IM01_03 Optimize and rationalize the IT operations	4.60	.380	.355	.

*No factor will be built from IM01_01 and IM01_03 due to a low Cronbach's Alpha of 0.506 with 2 items. Additionally, the variables are very skewed and have little scatter (IM01_01: Mean 4.6, Std. Dev. 0.616, N=161 and IM_01_03: Mean 4.37, Std. Dev. 0.833, N=162).





Reliability

Scale: all variables

Case Processing Summary

		N	%
Cases	Valid	160	98.8
	Excluded[a]	2	1.2
	Total	162	100.0

a. Listwise deletion based on all variables in the procedure.

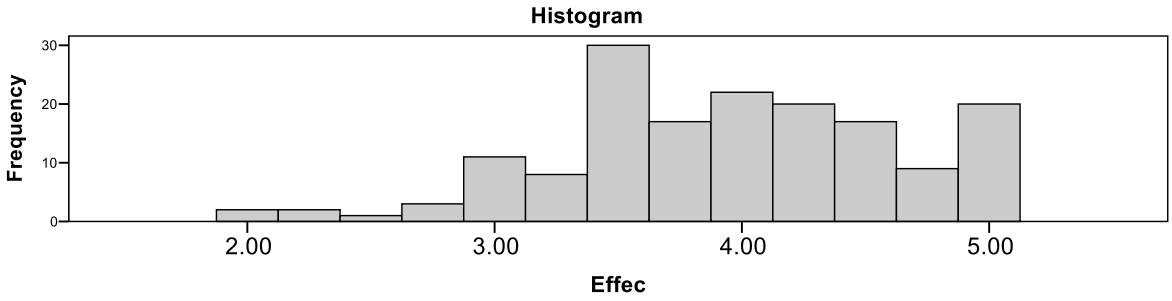
Reliability Statistics

Cronbach's Alpha	N of Items
.674	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
IM01_04 Enable new professional opportunities by using IT	11.55	4.865	.504	.586
IM01_05 Increase IT penetration in the Company	11.69	4.644	.460	.605
IM01_06 Reduce the complexity of business processes	11.76	4.748	.423	.629
IM01_07 Enable the capturing, processing and usage of real-time data	12.19	4.057	.460	.613

*The final distribution of the control variable Effec:



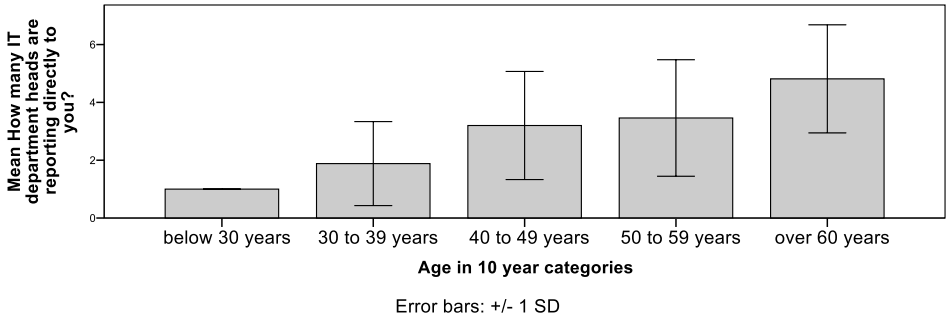
Appendix N: Analysis of potential influencing factors of age and gender on variables

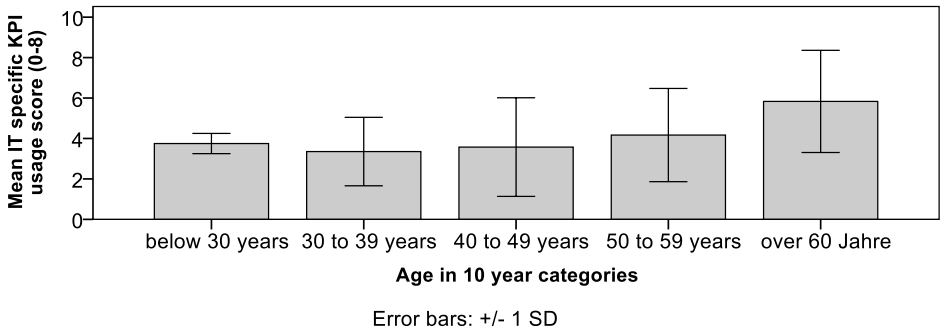
Pearson Correlation Matrix

		WM Work Motivation	JS Job Satisfaction	SD03 Age	SD01 Gender
WM Work Motivation	r	1			
	p				
	N	162			
JS Job Satisfaction	r	0.538**	1		
	p	< 0.001			
	N	162	162		
SD03 Age	r	0.008	0.143	1	
	p	0.917	0.071		
	N	161	161	161	
SD01 Gender	r	-0.096	-0.061	0.101	1
	p	0.225	0.443	0.202	
	N	161	161	160	161

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

The relationship between Age and Gender on one side and work motivation and job satisfaction on the other side is not significant, Therefor the decision was made that Age and Gender are not used as control variables.





Correlations of Age to all used constructs.

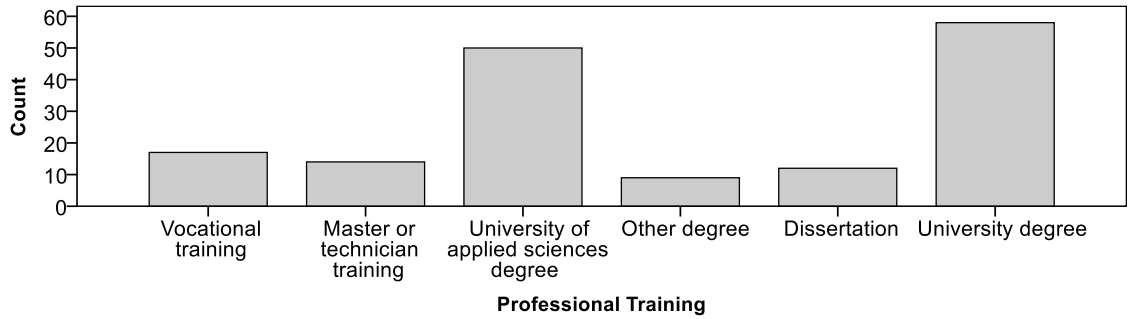
Correlations

		Age in 10 year categories
WM Work Motivation	r	0.008
	p	0.917
	N	161
JS Job Satisfaction	r	0.143
	p	0.071
	N	161
PAM Principal Agent Mutual Understanding	r	0.131
	p	0.100
	N	158
MIS Monetary Incentive System	r	0.149
	p	0.060
	N	160
PMS Performance Monitoring System	r	0.072
	p	0.366
	N	159
BITA Business IT-Alignment	r	0.009
	p	0.911
	N	161
PAT Principal Agent Trust	r	0.141
	p	0.075
	N	161
PIK Principal IT Knowledge	r	0.070
	p	0.378
	N	160
KUS IT specific KPI usage score (0-8)	r	0.253
	p	0.001
	N	157
Effec IT Effectivity	r	0.028
	p	0.726
	N	161
LS How many IT department heads are reporting directly to you?	r	0,372
	p	0.000
	N	139
TI Turnover Intention	r	-0.098
	p	0.220
	N	160

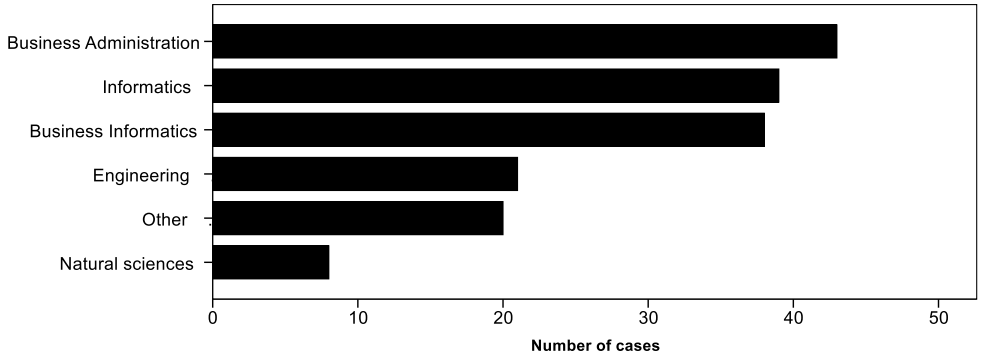
Appendix O: Letter to invited persons for the survey

Appendix P: Detailed descriptive statistics graphs from respondents of quantitative research

1. CIO background: professional education



2. CIO background: field of study

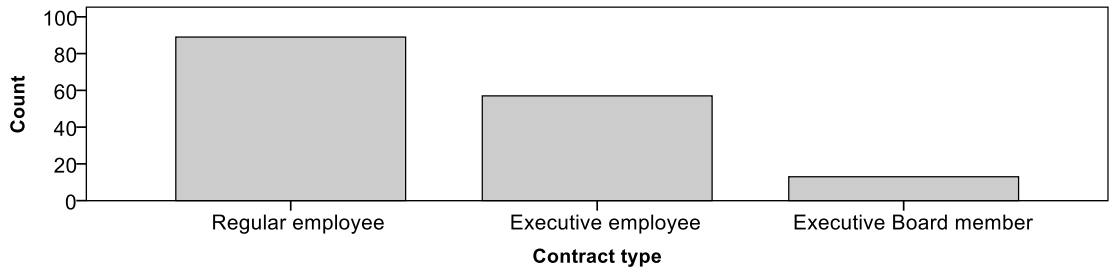


3. CIO demographics: country of origin

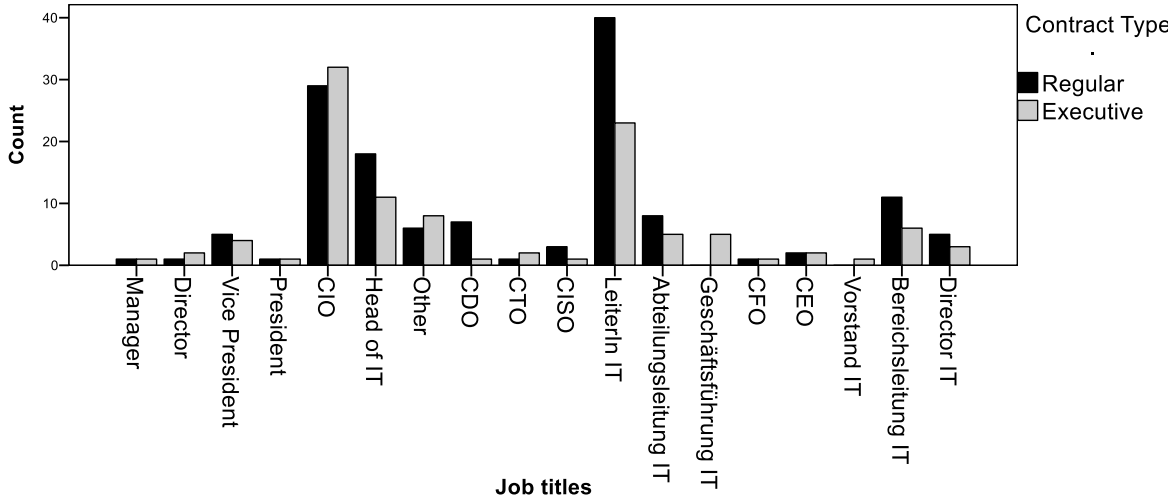
Country (D/A/CH)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Germany	138	85.2	86.8	86.8
	Austria	12	7.4	7.5	94.3
	Switzerland	7	4.3	4.4	98.7
	other	2	1.2	1.3	100.0
	Total	159	98.1	100.0	
Missing	not answered	3	1.9		
Total		162	100.0		

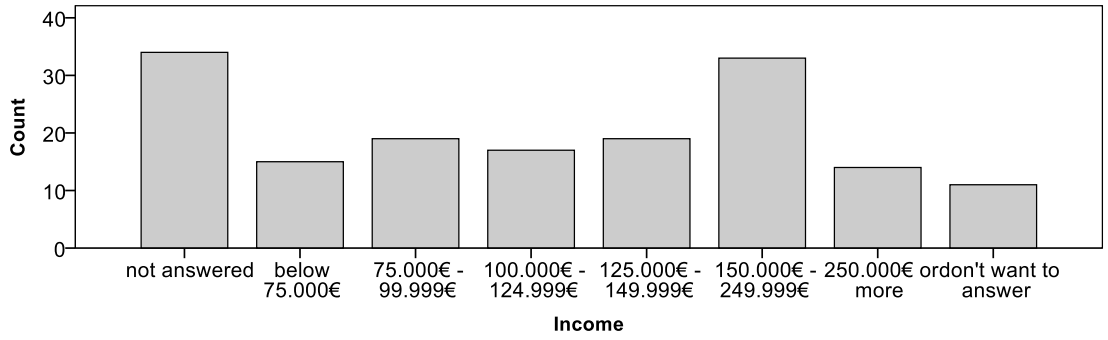
4. CIO employment: contract type

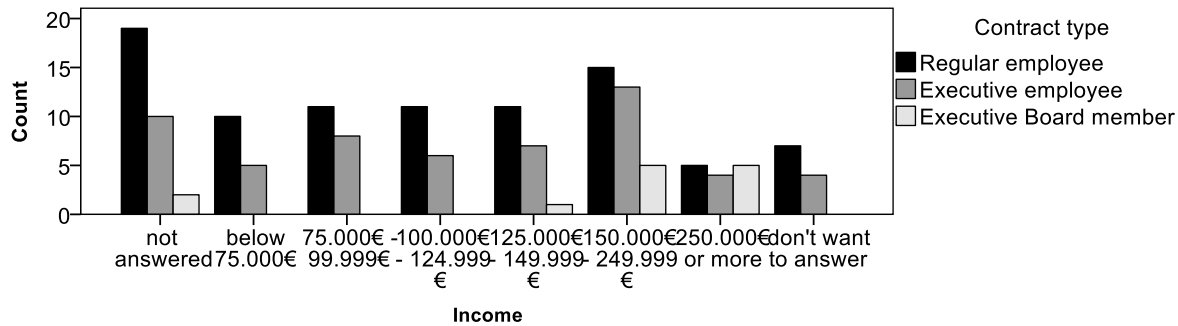


5. CIO employment: job title usage in contract group



6. CIO employment: income





7. CIO employment: income in contract groups

SD16 Income * SD14 Contract type Crosstabulation

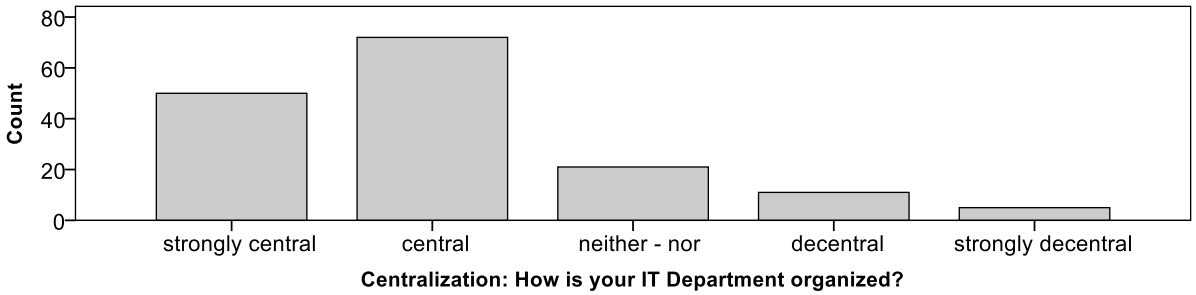
Count

		SD14 Contract type			
		4 Regular employee	8 Executive employee	9 Executive Board member	Total
SD16 Income	-9: not answered	19	10	2	31
	7: below 75.000€	10	5	0	15
	8: 75.000€ - 99.999€	11	8	0	19
	9: 100.000€ - 124.999€	11	6	0	17
	10: 125.000€ - 149.999€	11	7	1	19
	11: 150.000€ - 249.999€	15	13	5	33
	12: 250.000€ or more	5	4	5	14
	13: don't want to answer	7	4	0	11
Total		89	57	13	159

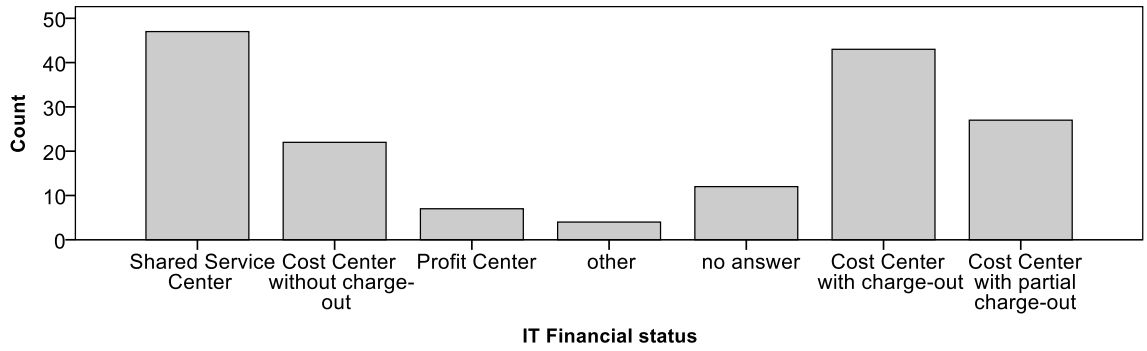
8. IT organization: IT KPIs

		# of Managed Clients	IT Cost in % of Turnover	# of IT Employees
N	Valid	137	140	148
	Missing	25	22	14
Minimum		0	0,4	0
Maximum		150000	50,0	240000
Quartil	25	205,50	1,800	7,00
Median	50	800,00	2,500	20,00
Quartil	75	3400,00	5,000	100,00

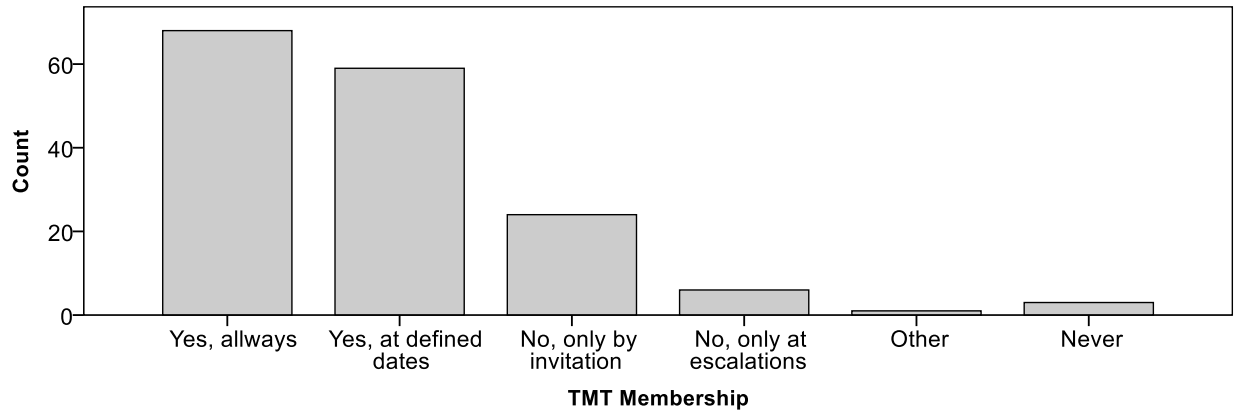
9. IT organization: centralization status



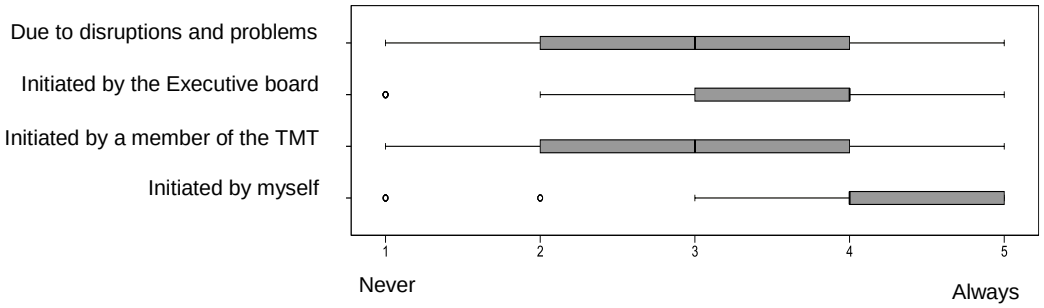
10. IT organization: financial status



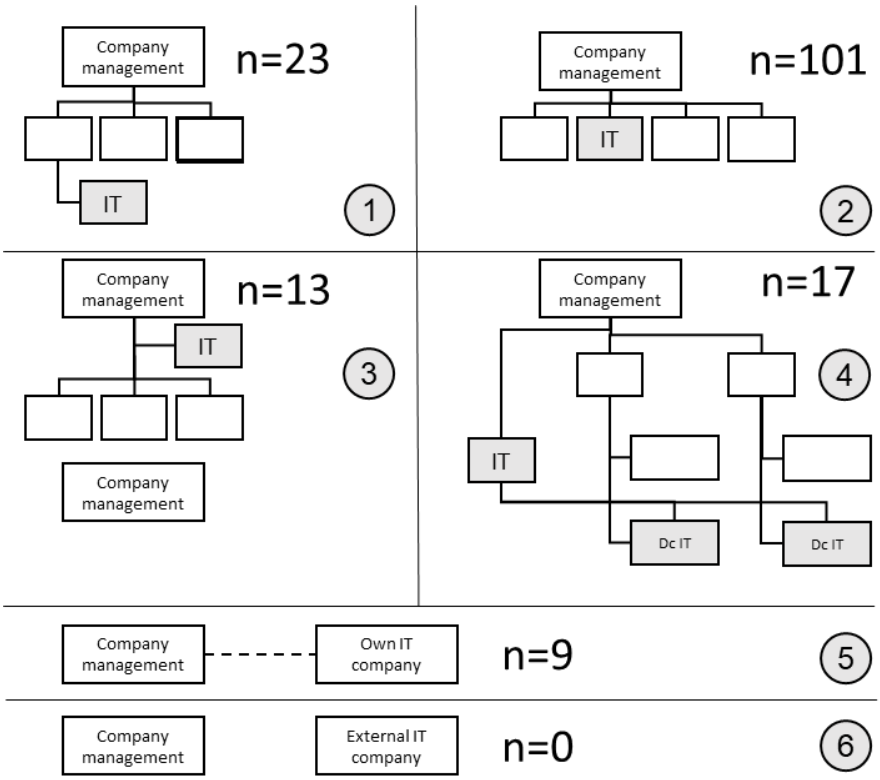
11. Organizational integration: top management team membership



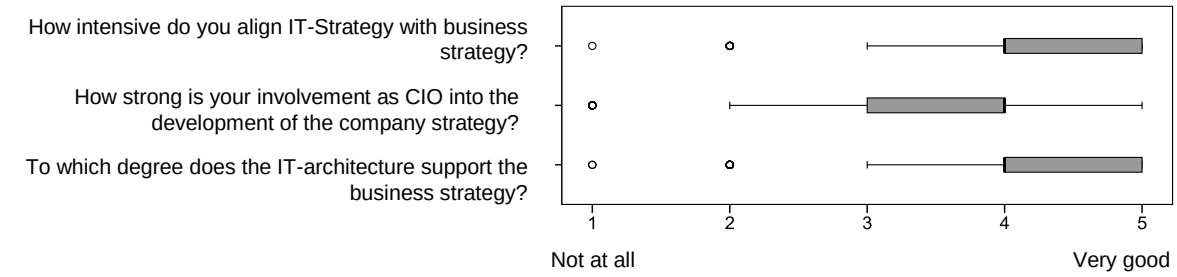
12. Organizational integration: top management team CIO presentation reasons



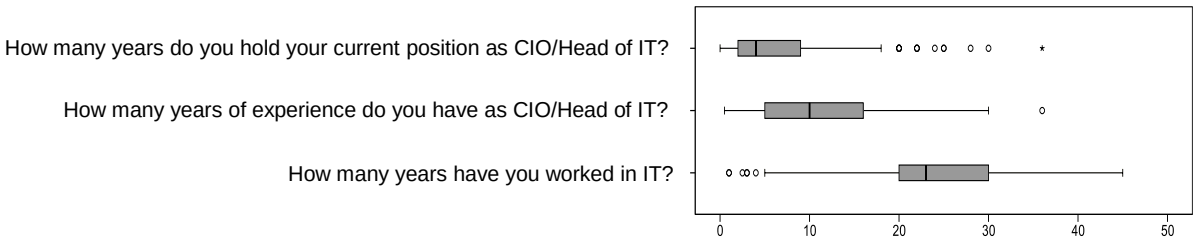
13. Organizational integration: IT department setup



14. Business-IT-alignment



15. IT Tenure



16. Top IT manager background related to management and business process experience (Tenure)

Business-IT-alignment not only requires process owners and the top management to have a piece of basic IT knowledge. Yet, also CIOs should have management knowledge and business process knowledge. Therefore a series of questions asked for this non-IT background knowledge of the CIOs which enables them to better communicate with the business process owners.

The table consisting of two cross tables splitting the respondents into 4 main groups according to their experience and background.

Same company

n=50		Managerial responsibility non	Managerial responsibility with
IT Background	non	3 30,0%	10 25,0%
	with	7 70,0%	30 75,0%

Different company

n=108		Managerial responsibility non	Managerial responsibility with
IT Background	non	1 11,1%	9 9,1%
	with	8 88,9%	90 90,9%

Professional Background*:

PLM	1	6
SCM	2	5
CRM	2	8
Support Processes	4	16
Management Processes	3	18
Business Consulting	1	13
IT Consulting	3	20
Non	2	3
Other	0	5

Professional Background*:

PLM	1	14
SCM	1	24
CRM	2	15
Support Processes	2	40
Management Processes	1	34
Business Consulting	3	32
IT Consulting	6	68
Non	0	14
Other	1	6

* multiple mentions possible

CRM: customer relationship management, PLM: product lifecycle management, SCM: supply chain management

Source: Author's own construction

The analysis shows that most CIOs already had managerial responsibility as well as IT backgrounds. On top of these basic experiences, some of the CIOs had experiences from the operative business processes (product lifecycle management, supply chain management, and customer relationship management). Most have a background in support and management processes. Interestingly also a background in IT and business consulting is quite common which

leads to the assumption that many former consultants might assume a job in the company in which they had a consulting assignment before. Unfortunately, the questionnaire was not designed to investigate this assumption.

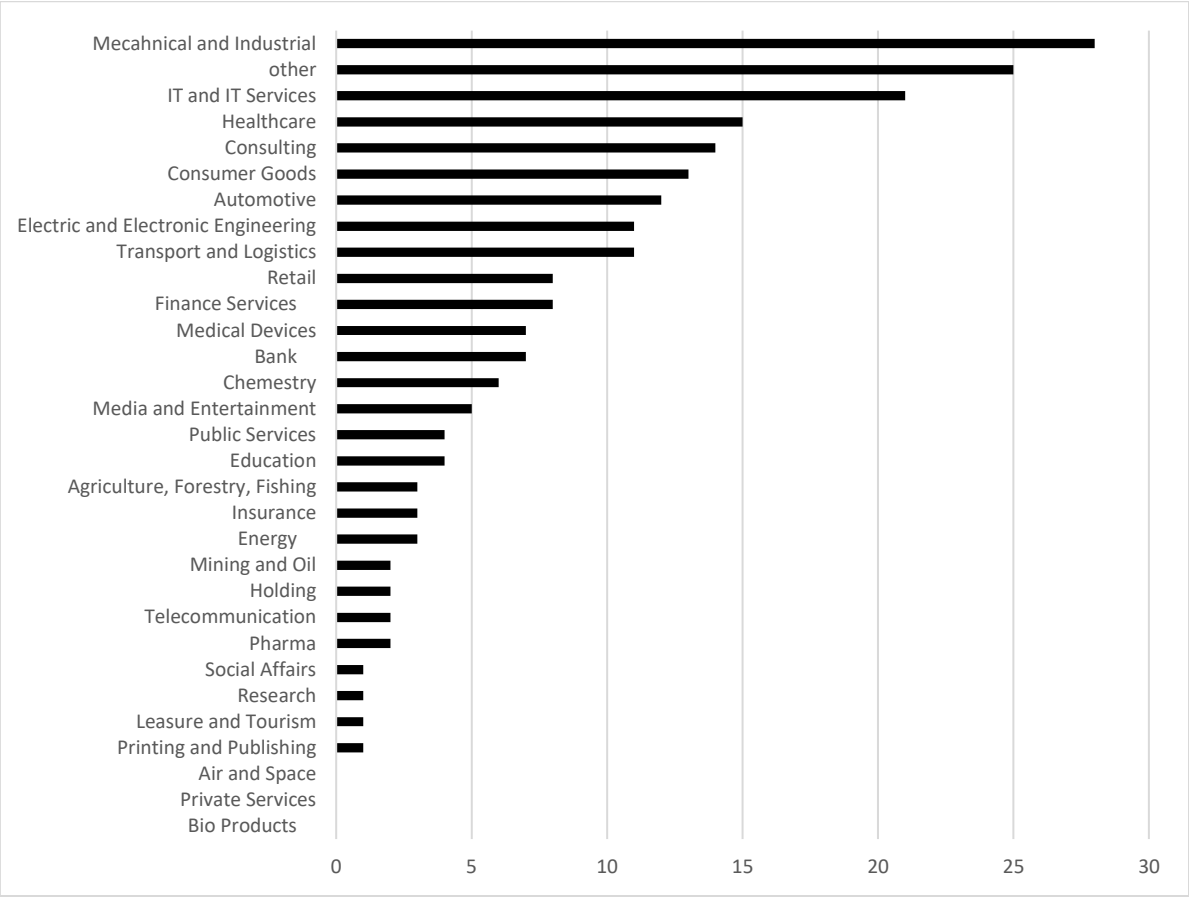
17. Company size of the top IT managers

		The company employs … Full time equivalents (FTE)	Yearly Turnover in Mio €	EBIT in Mio €/a	Active in … countries	No. Of Locations Worldwide
N	Valid	141	112	49	125	132
	Missing	21	50	113	37	30
Minimum		20	5	-6	1	1
Maximum		400000	250000000	60000000	200	5000
Percentiles	25	270	120	9	2	3
	50	1500	528	77	7	11
	75	5000	3000	250	29	35

Source: Author's own construction

18. Industry of the company for which the top IT managers is working for

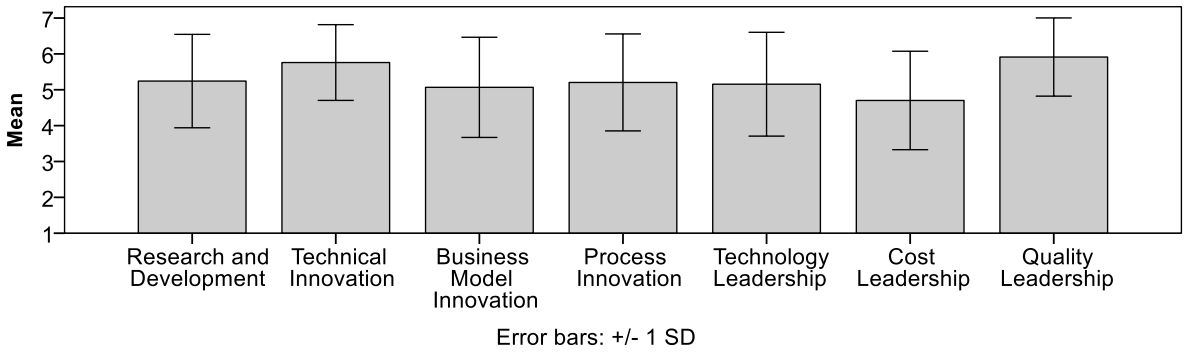
The survey used the Bisnode database (dun&bradstreet) (the original source of addresses of survey participants) to classify companies according to the well-established SIC Code 5 = Standard Industrial Classification(siccode.com Industry classification experts)). Surveys from other scholars e.g. Nissen and Termer (Termer and Nissen, 2013, p. 86) often use other industry classification systematics which reflects industries that are important for a specific reason. One example of such a specialty is the "Automotive industry" category. Trying to match this category with the SIC Codes would require extracting certain companies from Division D "Manufacturing" (SIC Codes 20-39).



Source: Author's own construction

19. Strategic orientation of the company

Termer and Nissen asked their survey participants three questions about the attitude of the top management regarding several aspects which influence the strategic orientation of their company among them research & development, innovation, and technology leadership (Termer and Nissen, 2013, p. 86). In the current research, the topic of innovation was split into three sub-questions (technical innovation, business model innovation, and process innovation). Additionally, the aspect of cost leadership was added. The results are shown in figure 3-17.



(1=extremely negative, 7=extremely positive)

Strategic orientation of the top IT managers company

Source: Author's own construction

The reported values from this research in the case of the unchanged dimensions (research and development, quality leadership) are comparable with those of Termer and Nissen.

The answers regarding the top management attitudes regarding the strategic orientation show strong and statistically significant correlations except for the area of cost leadership. The results are shown in the following table:

Strategic orientation of the top IT managers company - correlation matrix

Pearson Correlations

		Research and Development	Technical Innovations	Business Modell Inovation	Process Innovation	Technology Leadership	Cost Leadership	Quality Leadership
Research and Development	r	1						
	p							
	N	161						
Technical Innovations	r	.558**	1					
	p	<0.001						
	N	161	162					
Business Modell Inovation	r	.348**	.546**	1				
	p	<0.001	<0.001					
	N	161	162	162				
Process Innovation	r	.240**	.513**	.647**	1			
	p	0,002	<0.001	<0.001				
	N	161	162	162	162			
Technology Leadership	r	.436**	.567**	.321**	.223**	1		
	p	<0.001	<0.001	<0.001	0,004			
	N	160	161	161	161	161		
Cost Leadership	r	-0,102	0,105	0,118	0,082	0,064	1	
	p	0,199	0,186	0,137	0,298	0,418		
	N	160	161	161	161	161	161	
Quality Leadership	r	.329**	.389**	.333**	.306**	.354**	0,142	1
	p	<0.001	<0.001	<0.001	<0.001	<0.001	0,074	
	N	159	160	160	160	160	160	160

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

Source: Author's own construction

Appendix Q: Pearson correlation matrix

Pearson Correlation Matrix

		WM Work Motivation	JS Job Satisfaction	Principal Agent Mutual Understandi	MIS Monetary Incentive System	PMS Performanc e Monitoring System	BITA Business IT-Alignment	PAT Principal Agent Trust	PIK Principal IT Knowledge	IT specific KPI usage score (0-8)	Effec IT Effectivity	IT department heads direct reports	SD03 Age in 10 year categories
WM	r	1											
Work Motivation	p												
	N	162											
JS	r	0.538**	1										
Job Satisfaction	p	< 0.001											
	N	162	162										
PAM	r	0.337**	0.483**	1									
Principal Agent Mutual Understanding	p	< 0.001	< 0.001										
	N	158	158	158									
MIS	r	0.277**	0.502**	0.400**	1								
Monetary Incentive System	p	< 0.001	< 0.001	< 0.001									
	N	161	161	157	161								
PMS	r	0.332**	0.404**	0.538**	0.437**	1							
Performance Monitoring System	p	< 0.001	< 0.001	< 0.001	< 0.001								
	N	160	160	157	160	160							
BITA	r	0.443**	0.484**	0.429**	0.462**	0.368**	1						
Business IT-Alignment	p	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001							
	N	162	162	158	161	160	162						
PAT	r	0.244**	0.589**	0.563**	0.344**	0.462**	0.355**	1					
Principal Agent Trust	p	0,002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001						
	N	161	161	158	160	159	161	161					
PIK	r	0.214**	0.268**	0.396**	0.322**	0.489**	0.377**	0.381**	1				
Principal IT Knowledge	p	0.007	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001					
	N	161	161	158	160	160	161	160	161				
KUS	r	0.213**	0.188*	0.234**	0.298**	0.344**	0.269**	0.059	0.222**	1			
IT specific KPI usage score (0-8)	p	0.007	0.018	0.003	< 0.001	< 0.001	< 0.001	0.461	0.005				
	N	158	158	155	157	157	158	157	158	158			
Effec	r	0.383**	0.248**	0.288**	0.174*	0.129	0.372**	0.175*	0.217**	0.091	1		
IT Effectivity	p	< 0.001	0.001	< 0.001	0.027	0.104	< 0.001	0.027	0.006	0.257			
	N	162	162	158	161	160	162	161	161	158	162		
LS	r	0.073	0.281**	0.140	0.311**	-0.013	0.080	0.075	0.007	0.376**	0.006	1	
IT department heads direct reports	p	0.393	< 0.001	0.102	< 0.001	0.880	0.348	0.382	0.934	< 0.001	0.947		
	N	140	140	137	140	139	140	139	139	137	140	140	
SD03	r	0.008	0.143	0.131	0.149	0.072	0.009	0.141	0.070	0.253**	0.028	0.372**	1
Age in 10 year categories	p	0.917	0.0713	0.100	0.060	0.366	0.911	0.075	0.378	0.001	0.726	< 0.001	
	N	161	161	158	160	159	161	161	160	157	161	139	161

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

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

Source: authors own analysis performed with IBM SPSS Statistics 22

Appendix R: Test of hypothesis with bootstrapping where test of normality was found unacceptable

The following SPSS v.26 code was used to calculate the moderator effects and main effects with bootstrapping for cases where the test of normality was found unacceptable:

Legend:
DV: Dependent Variable, IV: Independent Variable, MV: Moderator Variable

```
****with moderator interaction***.

PRESERVE.
SET RNG=MT MTINDEX016857
SHOW RNG.

BOOTSTRAP
  /SAMPLING METHOD=SIMPLE
  /VARIABLES TARGET DV INPUT=IV MV KUS Effec LS
  /CRITERIA CILEVEL=95 CITYPE=BCA NSAMPLES=1000
  /MISSING USERMISSING=EXCLUDE.

UNIANOVA DV WITH IV MV KUS Effec LS
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /PRINT ETASQ PARAMETER
  /CRITERIA=ALPHA(.05)
  /DESIGN=IV MV KUS Effec LS IV*MV
RESTORE.

****without moderator interaction***.

PRESERVE.
SET RNG=MT MTINDEX016857
SHOW RNG.

BOOTSTRAP
  /SAMPLING METHOD=SIMPLE
  /VARIABLES TARGET DV INPUT=IV KUS Effec LS
  /CRITERIA CILEVEL=95 CITYPE=BCA NSAMPLES=1000
  /MISSING USERMISSING=EXCLUDE.

UNIANOVA DV WITH IV KUS Effec LS
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /PRINT ETASQ PARAMETER
  /CRITERIA=ALPHA(.05)
  /DESIGN=IV KUS Effec LS
RESTORE.
```

Result of bootstrapping for Moderator Effects:

No.	DV with IV MV CV1, CV2, CV3	B (CI)	p.Eta²	p	R²
1	JS with PAM PAT KUS Effec LS	-0.118 (-0.287 – 0.051)	0.015	0.123	0.468
2	JS with PAM PIK KUS Effec LS	-0.091 (-0.280 – 0.040	0.005	0.318	0.344
3	JS with BITA PIK KUS Effec LS	-0.085 (-0.307 – 0.169)	0.004	0.494	0.327
4	JS with PMS PIK KUS Effec LS	0.006 (-0.151 – 0.180)	0.000	0.953	0.329
5	JS with MIS PAT KUS Effec LS	-0.143 (-.0277 - -0.034)	0.041	0.028	0.529

JS with PAM PAT KUS Effec LS

Bootstrap for Parameter Estimates

Dependent Variable: Job Satisfaction

Parameter	B	Bootstrap[a]				
		Bias	Std. Error	Sig. (2-tailed)	BCa 95% Confidence Interval	
					Lower	Upper
Intercept	-.486	-.065	1.086	.661	-2.611	1.507
PAM	.735	.008	.319	.022	.071	1.437
PAT	.831	.014	.272	.002	.292	1.417
KUS	.014	.000	.036	.726	-.056	.089
Effec	.191	.005	.099	.061	-.008	.406
LS	.107	.000	.037	.005	.033	.177
PAM * PAT	-.118	-.003	.080	.123	-.269	.026

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

JS with PAM KUS Effec LS

Bootstrap for Parameter Estimates without moderating effect

Dependent Variable:

Parameter	B	Bootstrap[a]				
		Bias	Std. Error	Sig. (2-tailed)	BCa 95% Confidence Interval	
					Lower	Upper
Intercept	1,617	-0,026	0,481	0,001	0,697	2,426
PAM	0,635	0,003	0,096	0,001	0,444	0,818
KUS	-0,006	-0,001	0,040	0,899	-0,080	0,070
Effec	0,159	0,005	0,103	0,122	-0,057	0,384
LS	0,108	-0,001	0,040	0,008	0,030	0,184

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

JS with PAM PIK KUS Effec LS

Bootstrap for Parameter Estimates

Dependent Variable: Job Satisfaction

Parameter	B	Bootstrap[a]				
		Bias	Std. Error	Sig. (2-tailed)	BCa 95% Confidence Interval	
					Lower	Upper
Intercept	.469	-.213	1.234	.682	-1.973	2.147
PAM	.850	.052	.298	.007	.326	1.646
PIK	.444	.054	.379	.229	-.254	1.405
KUS	-.010	.000	.042	.814	-.088	.076
Effec	.165	.006	.105	.115	-.052	.394
LS	.115	.001	.041	.005	.039	.197
PAM * PIK	-.091	-.015	.095	.318	-.280	.040

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

JS with PAM KUS Effec LS

Bootstrap for Parameter Estimates without moderating effect

Dependent Variable:

		Bootstrap[a]				
					BCa 95% Confidence Interval	
Parameter	B	Bias	Std. Error	Sig. (2-tailed)	Lower	Upper
Intercept	1,617	-0,026	0,481	0,001	0,697	2,426
PAM	0,635	0,003	0,096	0,001	0,444	0,818
KUS	-0,006	-0,001	0,040	0,899	-0,080	0,070
Effec	0,159	0,005	0,103	0,122	-0,057	0,384
LS	0,108	-0,001	0,040	0,008	0,030	0,184

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

JS with BITA PIK KUS Effec LS

Bootstrap for Parameter Estimates

Dependent Variable: Job Satisfaction

Parameter	B	Bootstrap[a]				
		Bias	Std. Error	Sig. (2-tailed)	BCa 95% Confidence Interval	
					Lower	Upper
Intercept	.665	.008	1.661	.681	-2.071	3.947
BITA	.754	-.010	.374	.044	-.074	1.386
PIK	.495	-.008	.527	.340	-.648	1.486
KUS	-.022	.002	.032	.490	-.083	.051
Effec	.130	.009	.121	.306	-.124	.385
LS	.132	-.002	.040	.004	.051	.204
BITA * PIK	-.085	.002	.126	.494	-.307	.169

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

JS with BITA KUS Effec LS

Bootstrap for Parameter Estimates without moderating effect

Dependent Variable:

		Bootstrap[a]				
					BCa 95% Confidence Interval	
Parameter	B	Bias	Std. Error	Sig. (2-tailed)	Lower	Upper
Intercept	1,966	-0,012	0,589	0,001	0,803	3,064
BITA	0,553	-0,005	0,100	0,001	0,332	0,734
KUS	-0,018	0,002	0,033	0,563	-0,081	0,057
Effec	0,124	0,006	0,114	0,292	-0,123	0,356
LS	0,131	-0,002	0,040	0,005	0,051	0,206

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

JS with PMS PIK KUS Effec LS

Bootstrap for Parameter Estimates

Dependent Variable: Job Satisfaction

Parameter	B	Bootstrap[a]				
		Bias	Std. Error	Sig. (2-tailed)	BCa 95% Confidence Interval	
					Lower	Upper
Intercept	1.301	.076	1.272	.316	-.909	3.913
PMS	.435	-.013	.280	.117	-.182	.949
PIK	.022	-.026	.415	.956	-.843	.771
KUS	-.045	.003	.043	.281	-.133	.057
Effec	.309	.000	.102	.004	.111	.501
LS	.166	-.002	.041	.002	.088	.240
PMS * PIK	.006	.004	.089	.953	-.151	.180

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

JS with PMS KUS Effec LS

Bootstrap for Parameter Estimates without moderating effect

Dependent Variable:

		Bootstrap[a]				
					BCa 95% Confidence Interval	
Parameter	B	Bias	Std. Error	Sig. (2-tailed)	Lower	Upper
Intercept	1,259	0,008	0,453	0,009	0,263	2,218
PMS	0,473	-0,002	0,071	0,001	0,334	0,608
KUS	-0,044	0,002	0,042	0,285	-0,126	0,045
Effec	0,317	-0,001	0,099	0,002	0,130	0,505
LS	0,166	-0,002	0,041	0,001	0,085	0,241

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

JS with MIS PAT KUS Effec LS

Bootstrap for Parameter Estimates

Dependent Variable:

		Bootstrap[a]				
					BCa 95% Confidence Interval	
Parameter	B	Bias	Std. Error	Sig. (2-tailed)	Lower	Upper
Intercept	-0,786	-0,069	0,959	0,399	-2,771	0,806
MIS	0,866	0,017	0,262	0,001	0,380	1,480
PAT	0,935	0,012	0,246	0,001	0,473	1,474
KUS	0,009	-0,002	0,030	0,763	-0,044	0,064
Effec	0,173	0,006	0,096	0,072	-0,026	0,384
LS	0,068	0,001	0,037	0,062	-0,003	0,145
MIS * PAT	-0,143	-0,004	0,067	0,028	-0,277	-0,034

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Appendix S: Detailed SPSS output for test of normal distribution of residuals

The following SPSS 22 code was used to generate, save, test, and delete the residues:

Legend: DV: Dependent Variable, IV: Independent Variable, MV: Moderator Variable CV: Confounder Variable

```
UNIANOVA DV WITH IV MV CV1 CV2 CV3
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /SAVE=RESID
  /PRINT=PARAMETER
  /CRITERIA=ALPHA(.05)
  /DESIGN=IV MV CV1 CV2 CV3 IV*MV

EXAMINE VARIABLES=RES_1
  /PLOT BOXPLOT NPPLOT
  /COMPARE GROUPS
  /STATISTICS NONE
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.

DELETE VARIABLES RES_1.
```

Combinations to be tested:

DV		IV	MV		CV1	CV 2	CV 3
WM	with	PAM	PAT		KUS	Effec	
WM	with	BITA	PAT		KUS	Effec	
WM	with	PMS	PAT		KUS	Effec	
WM	with	MIS	PAT		KUS	Effec	
WM	with	PAM		PIK	KUS	Effec	
WM	with	BITA		PIK	KUS	Effec	
WM	with	PMS		PIK	KUS	Effec	
WM	with	MIS		PIK	KUS	Effec	
JS	with	PAM	PAT		KUS	Effec	LS
JS	with	BITA	PAT		KUS	Effec	LS
JS	with	PMS	PAT		KUS	Effec	LS
JS	with	MIS	PAT		KUS	Effec	LS
JS	with	PAM		PIK	KUS	Effec	LS
JS	with	BITA		PIK	KUS	Effec	LS
JS	with	PMS		PIK	KUS	Effec	LS
JS	with	MIS		PIK	KUS	Effec	LS

Statistic Values for Kolmogorov-Smirnov should be < 0.1

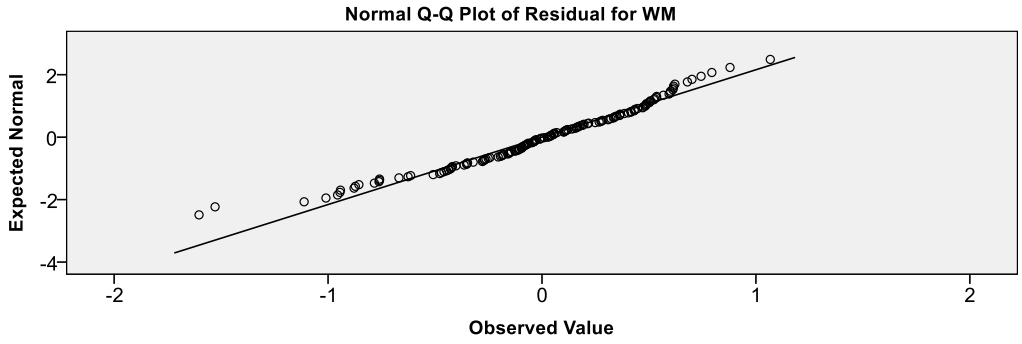
Statistic Values for Shapiro-Wilk should be >0.95

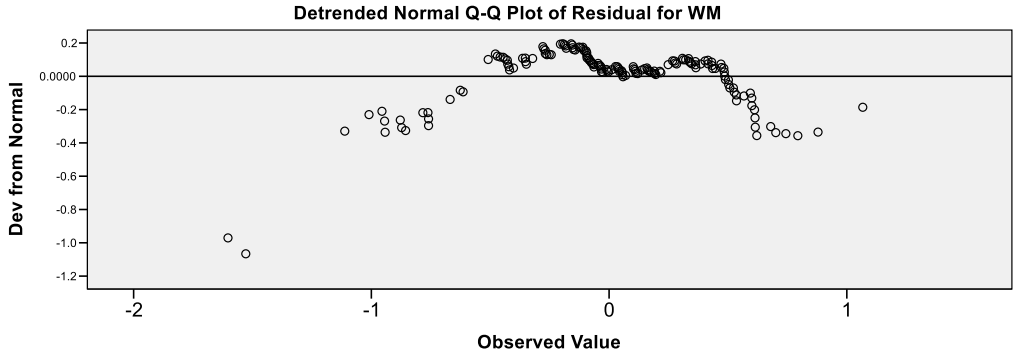
1. WM with PAM PAT KUS Effec

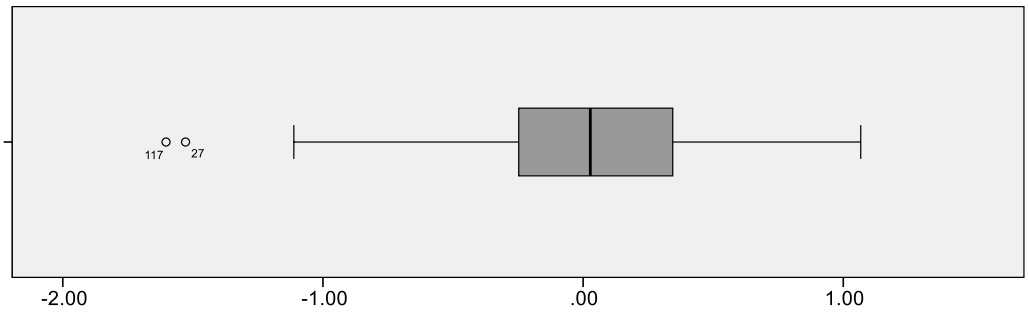
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for WM	.075	155	.033	.969	155	.001

a. Lilliefors Significance Correction





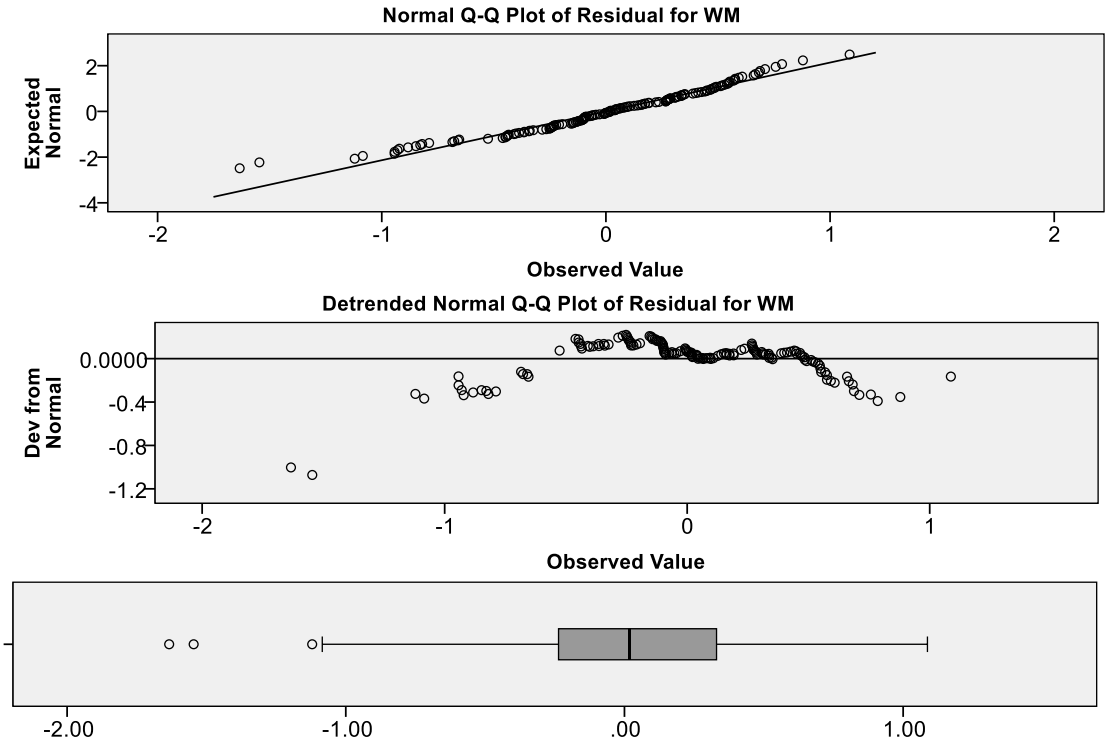


2. WM with PAM PIK KUS Effec

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for WM	.080	155	.017	.968	155	.001

a. Lilliefors Significance Correction



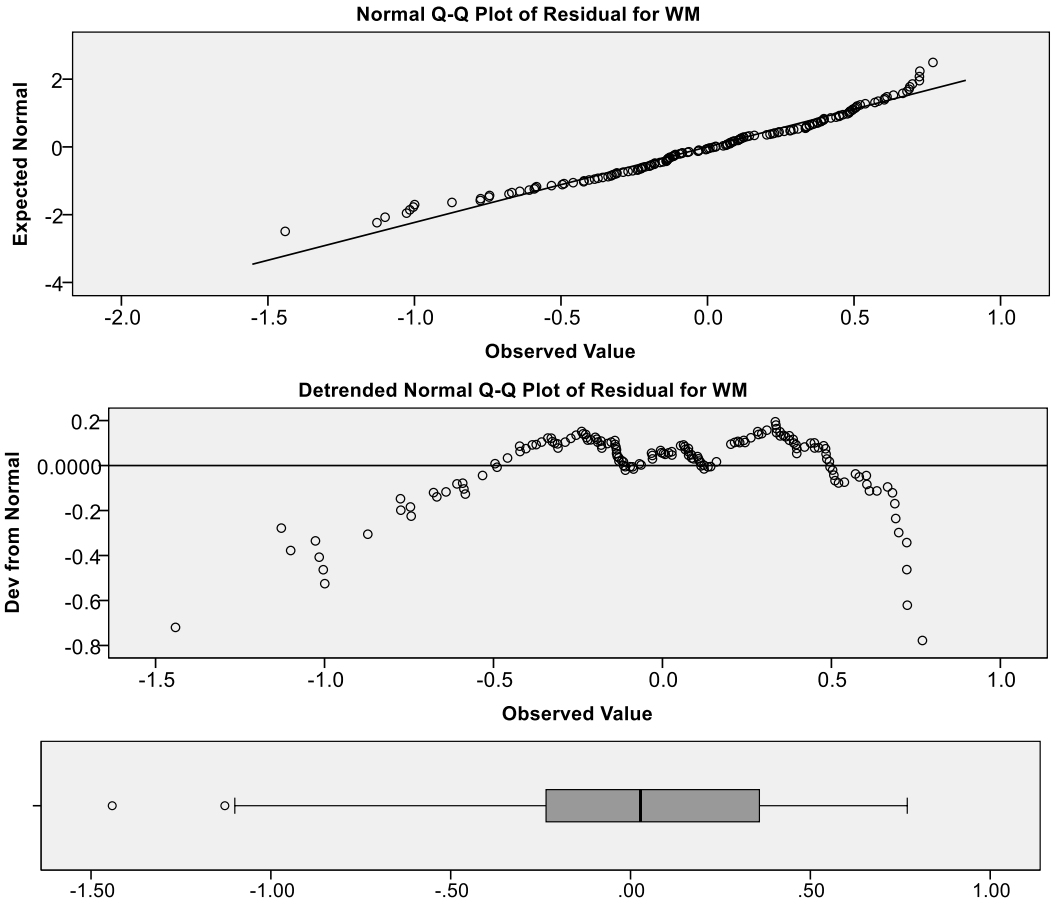
3. WM with BITA PAT KUS Effec

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for WM	.065	157	.200*	.970	157	.002

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction



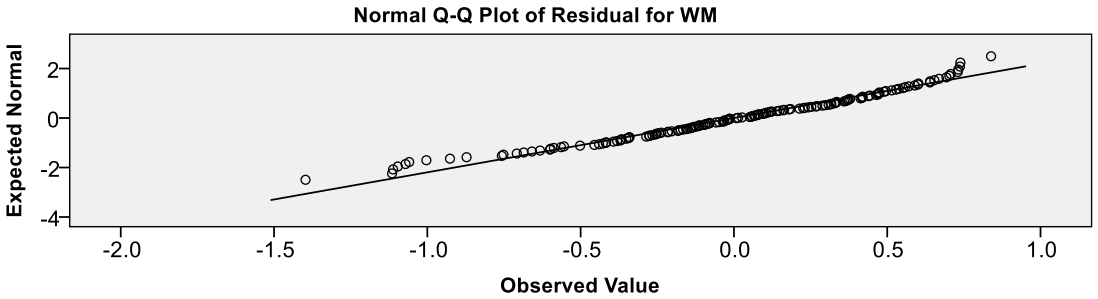
4. WM with BITA PIK KUS Effec

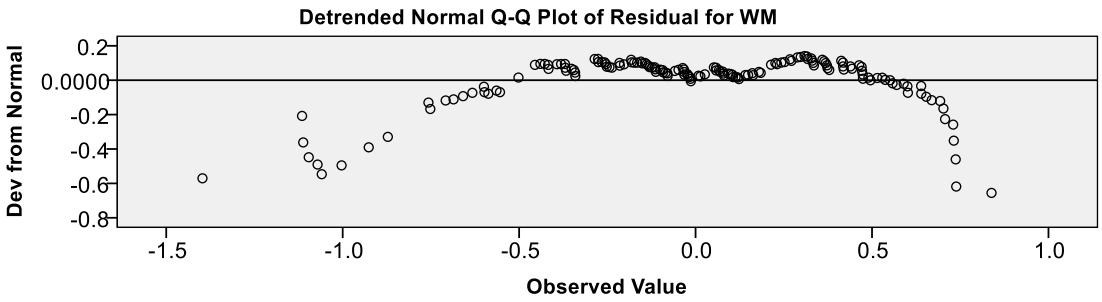
Tests of Normality

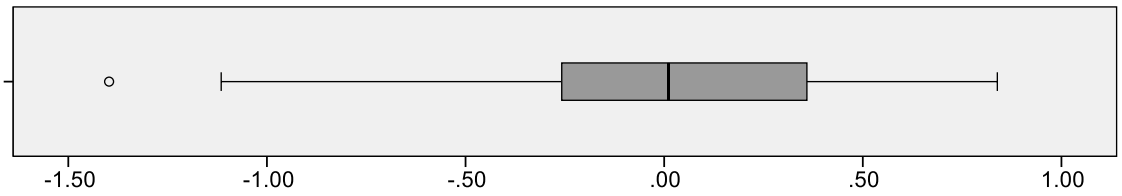
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for WM	.051	157	.200*	.977	157	.009

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction







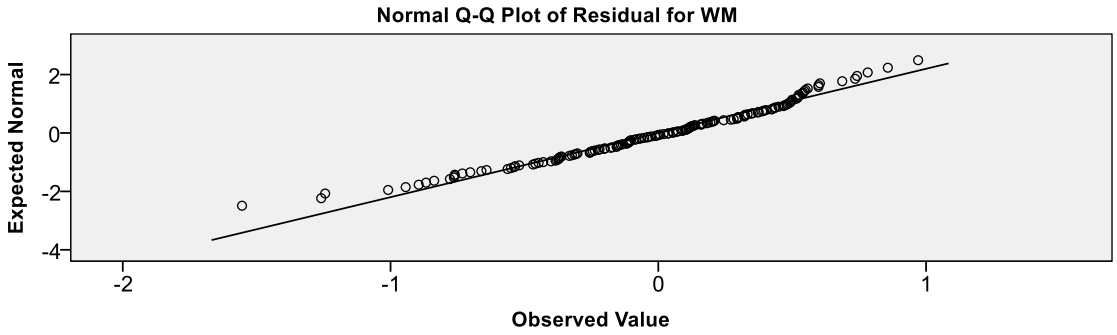
5. WM with PMS PAT KUS Effec

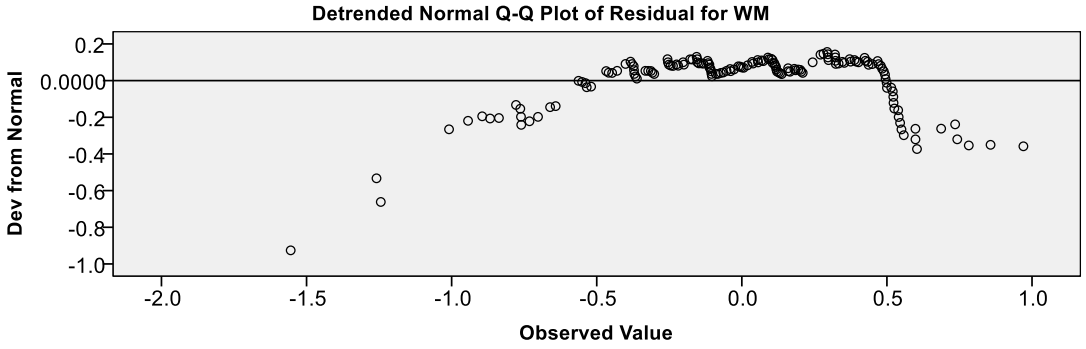
Tests of Normality

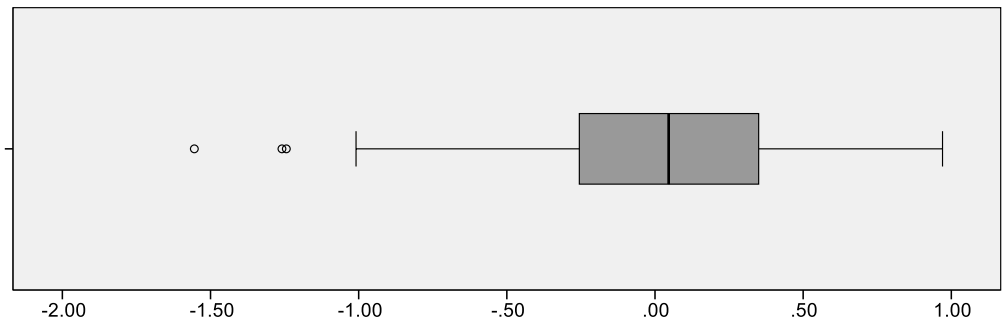
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for WM	.055	156	.200*	.974	156	.005

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction







6. WM with PMS PIK KUS Effec

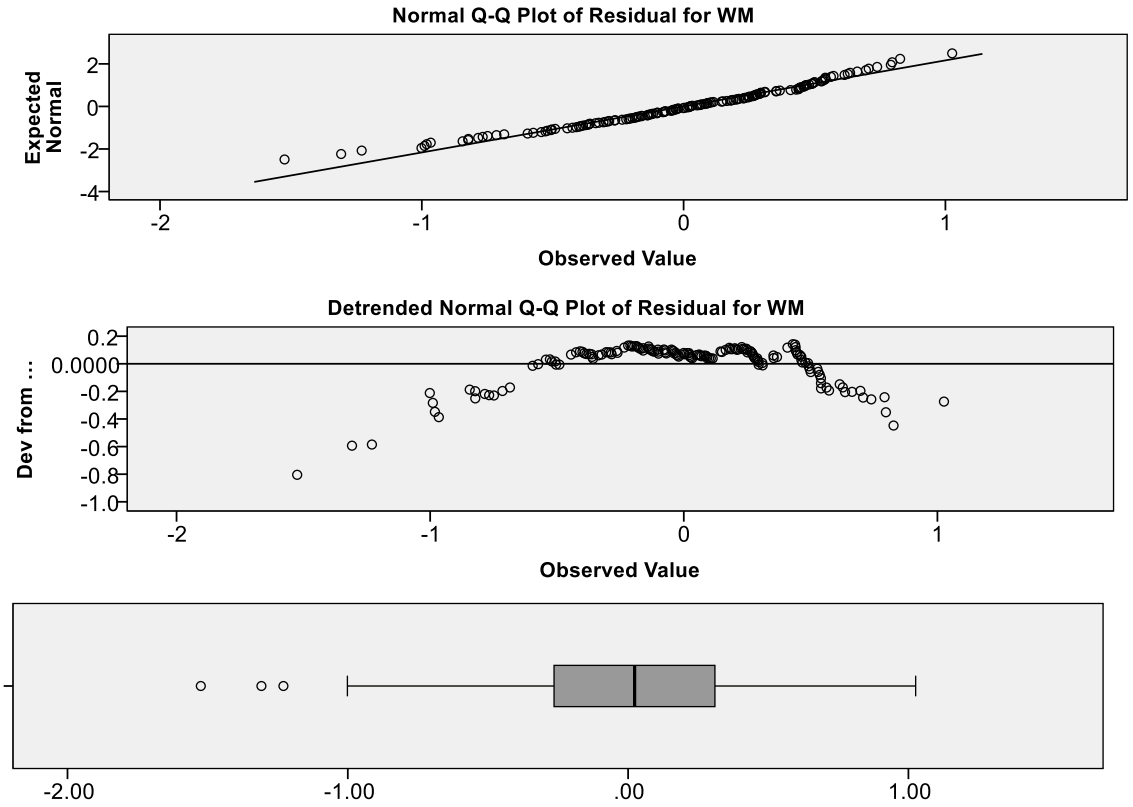
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for WM	.051	157	.200*	.977	157	.009

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

b.

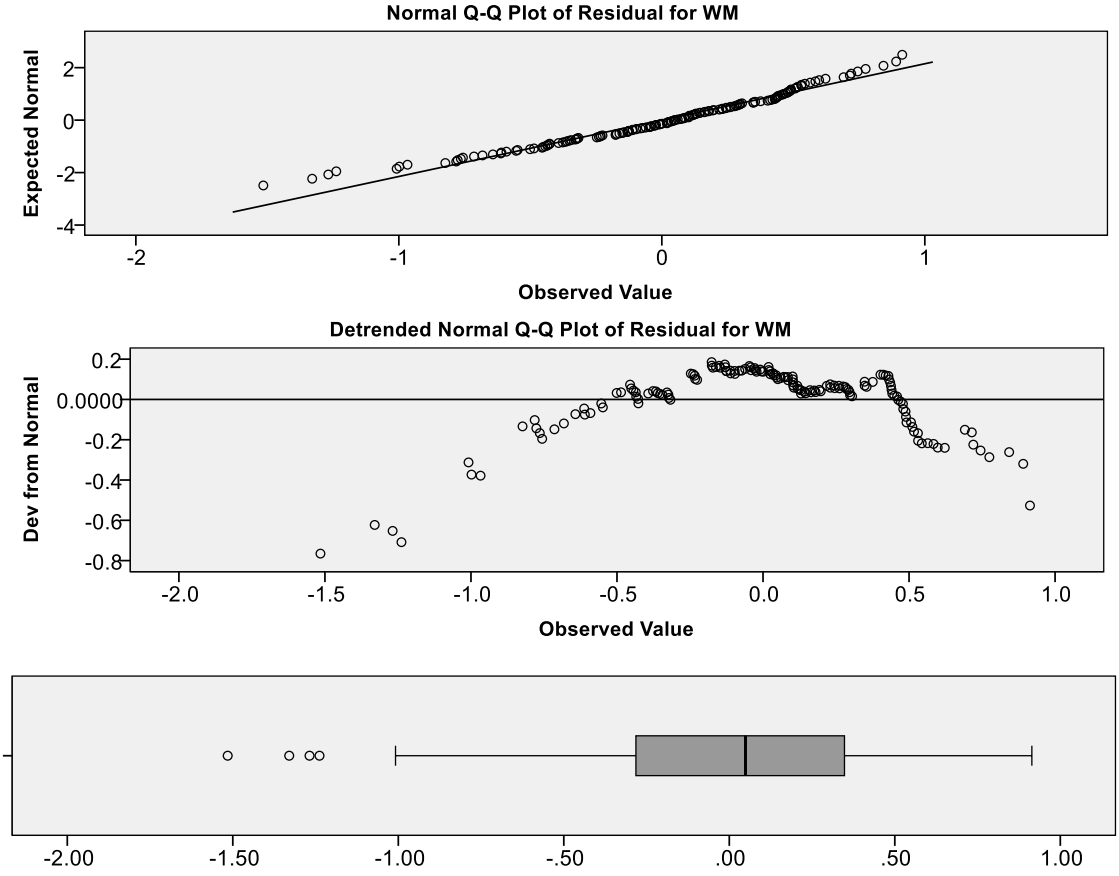


7. WM with MIS PAT KUS Effec

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for WM	.071	156	.055	.970	156	.002

a. Lilliefors Significance Correction



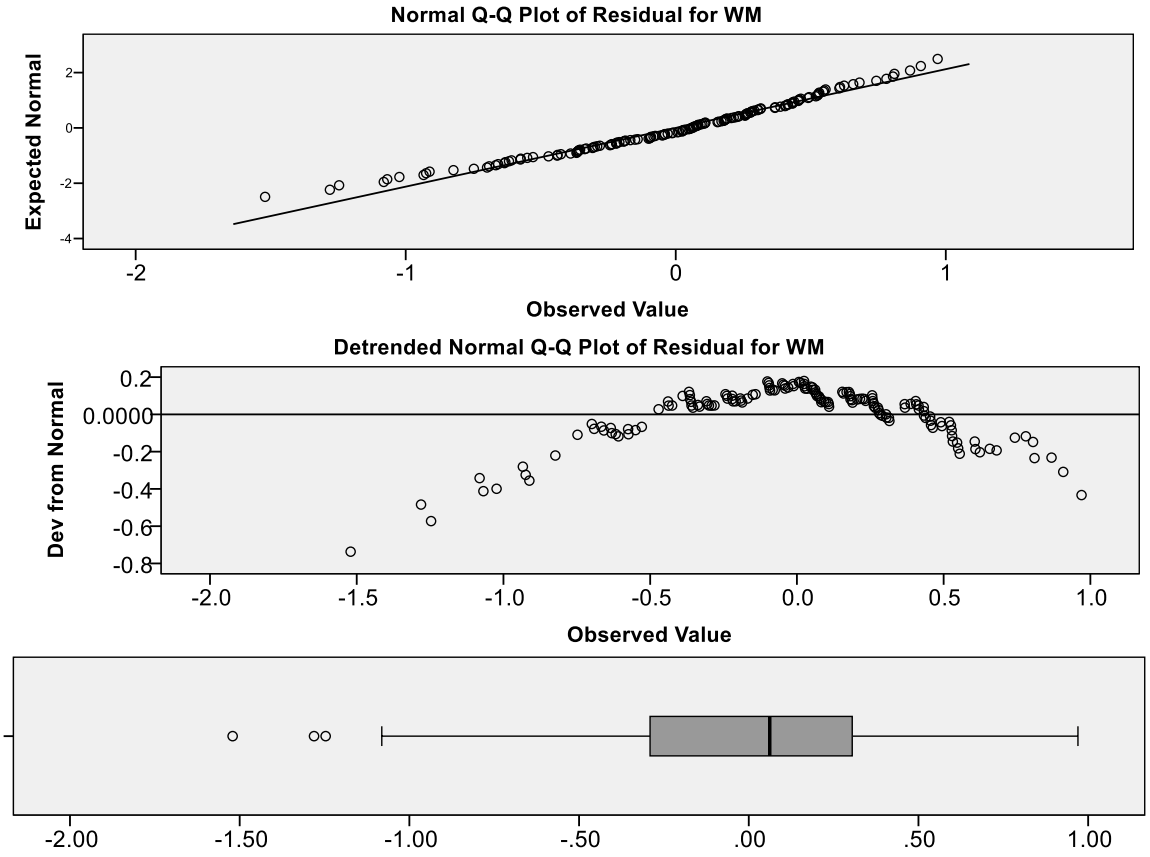
8. WM with MIS PIK KUS Effec

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for WM	.075	157	.032	.976	157	.007

a. Lilliefors Significance Correction

b.

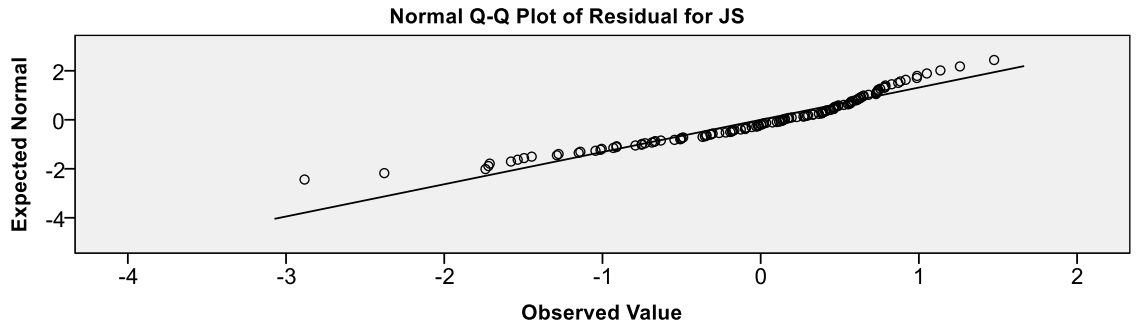


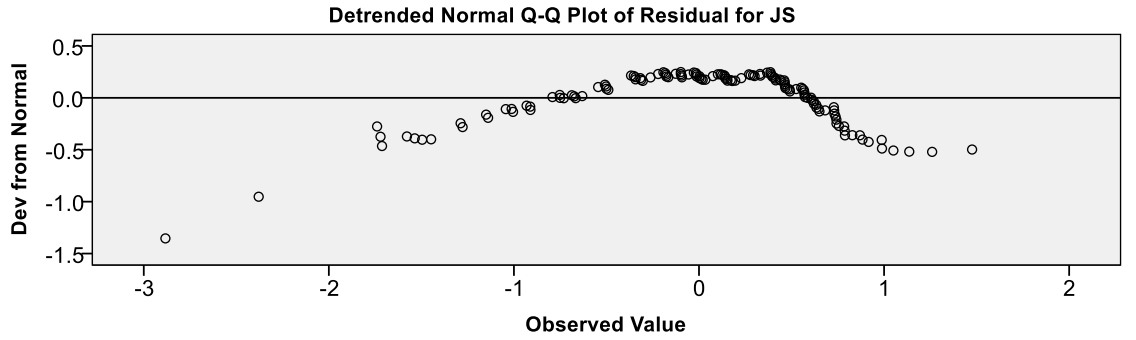
9. JS with PAM PAT KUS Effec LS

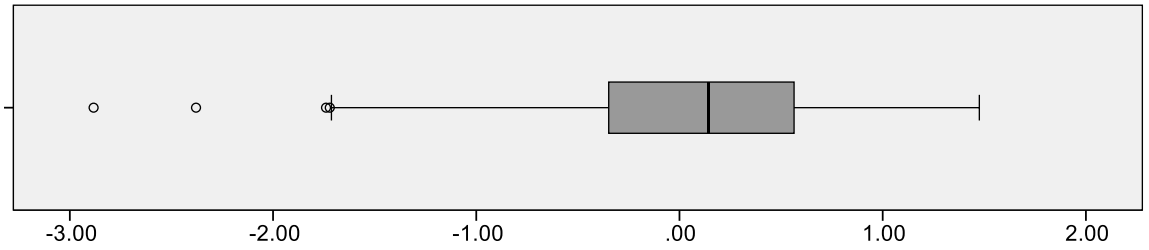
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for JS	.101	135	.002	.933	135	.000

a. Lilliefors Significance Correction







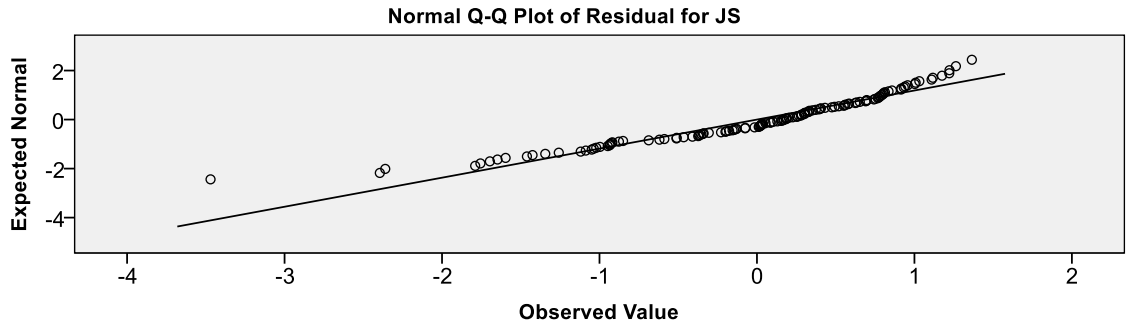
In the test of normality, statistic value for Kolmogorov-Smirnov is above 0.100 and value for Sharpiro-Wilk is below 0.95, the hypothesis test will be calculated with bootstrap methodology.

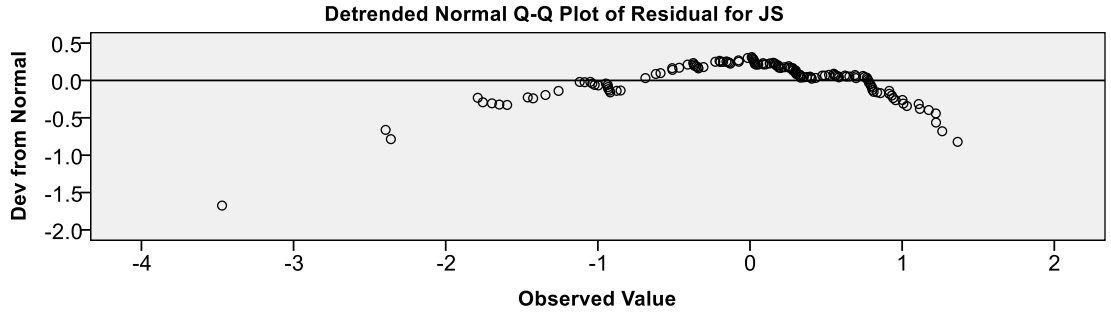
10. JS with PAM PIK KUS Effec LS

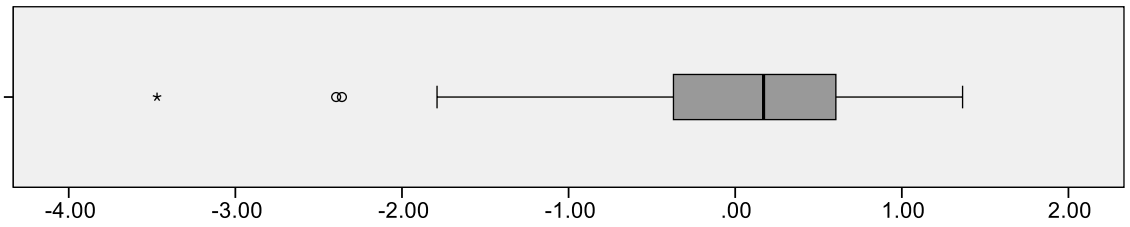
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for JS	.127	135	.000	.930	135	.000

a. Lilliefors Significance Correction







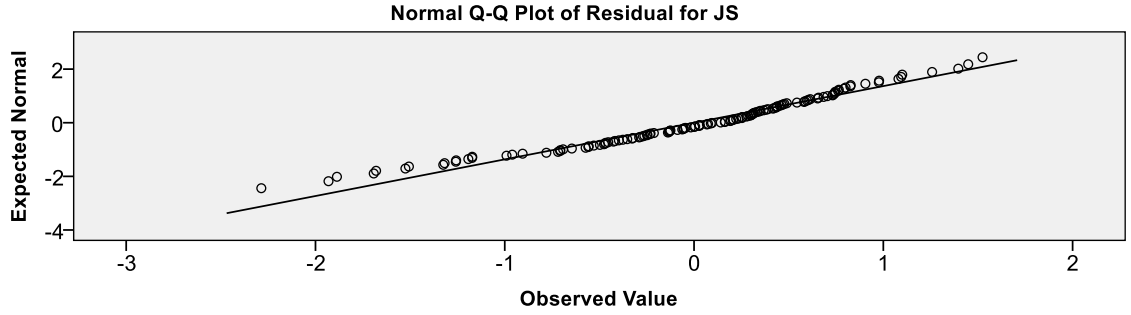
In the test of normality, statistic value for Kolmogorov-Smirnov is above 0.100 and value for Sharpiro-Wilk is below 0.95, the hypothesis test will be calculated with bootstrap methodology.

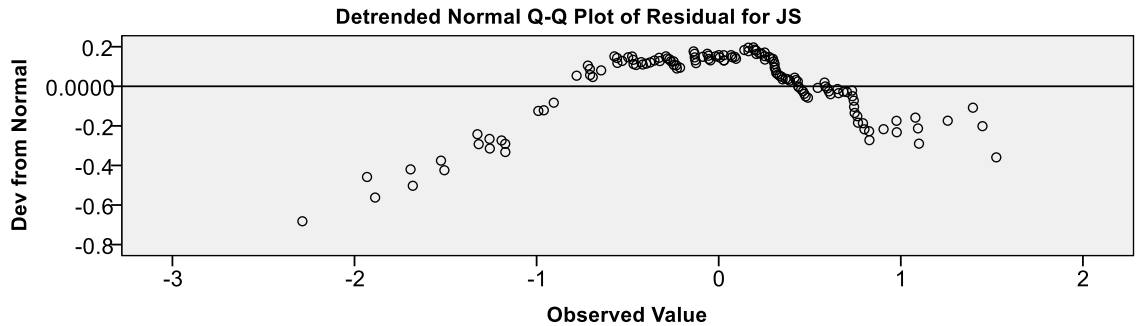
11. JS with BITA PAT KUS Effec LS

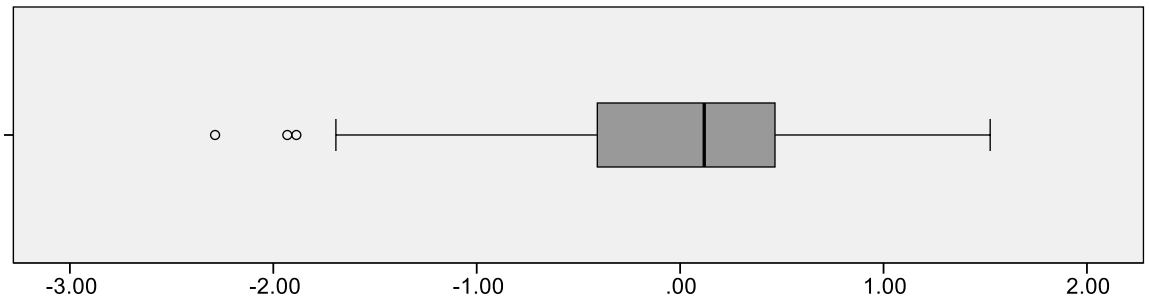
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for JS	.081	136	.030	.967	136	.002

a. Lilliefors Significance Correction





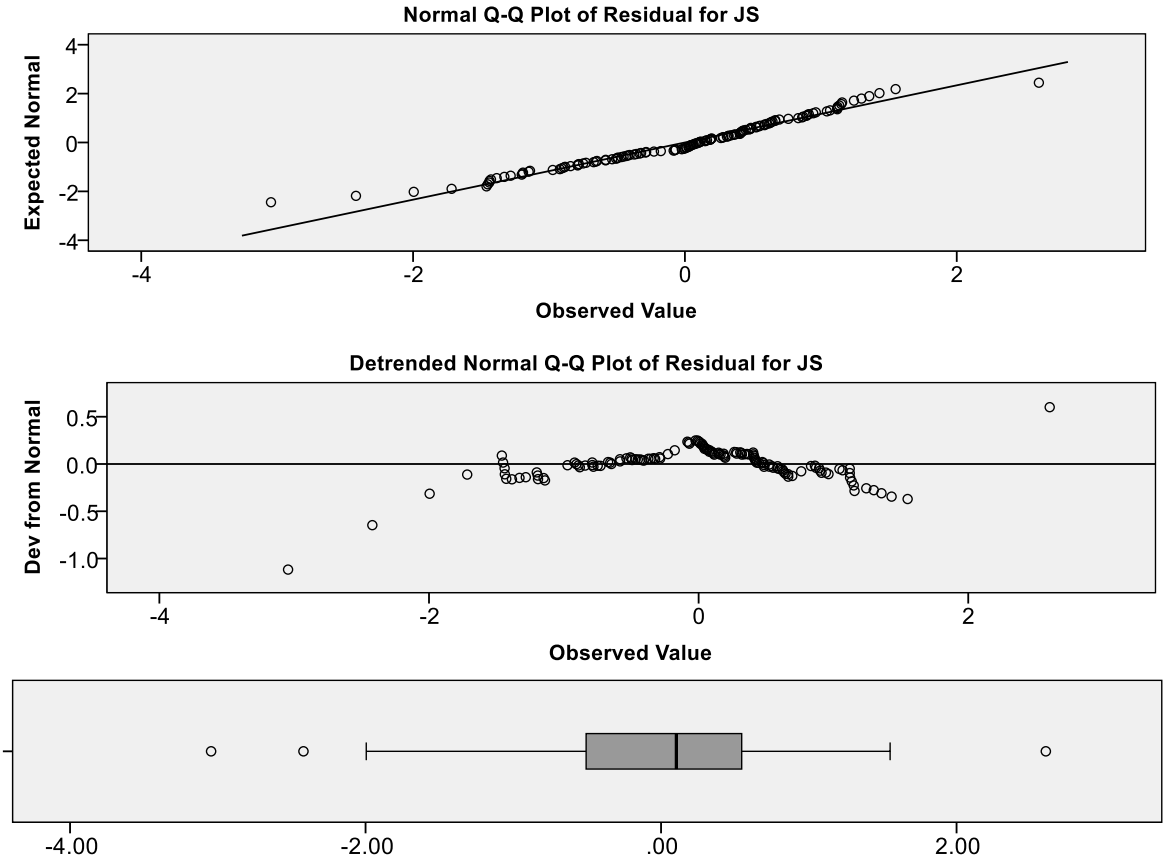


12. JS with BITA PIK KUS Effec LS

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for JS	.102	137	.001	.976	137	.016

a. Lilliefors Significance Correction



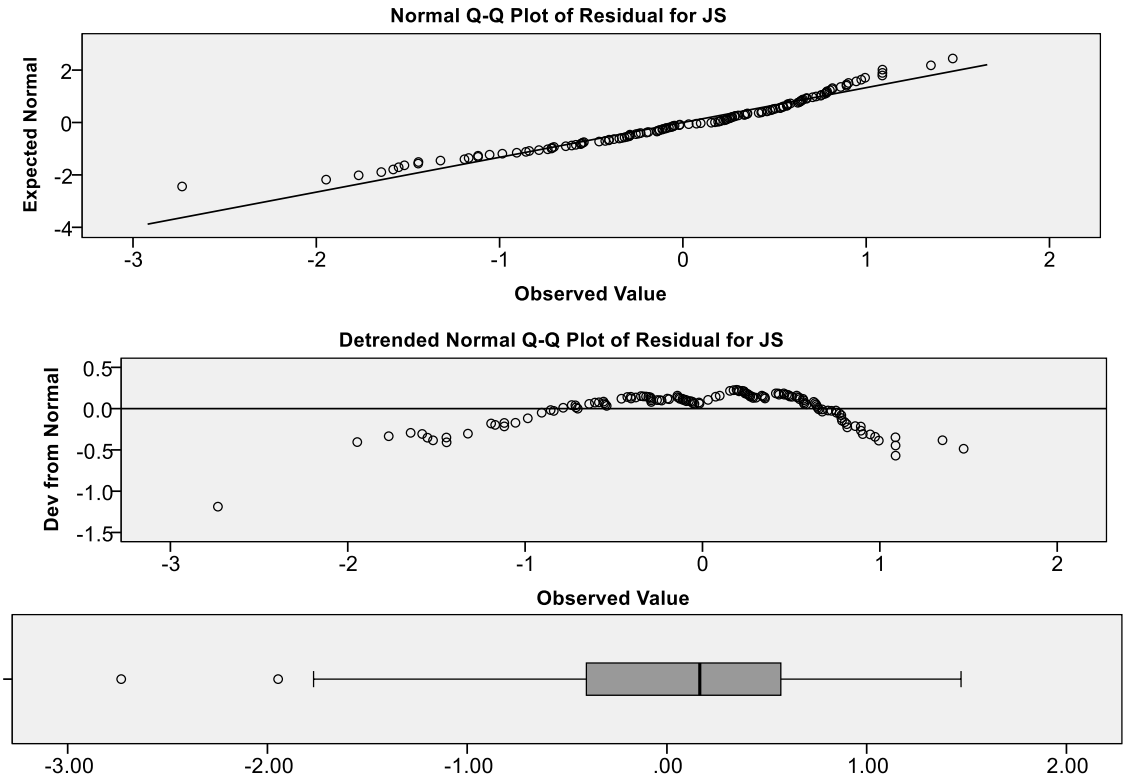
In the test of normality, statistic value for Kolmogorov-Smirnov is above 0.100, the hypothesis test will be calculated with bootstrap methodology.

13. JS with PMS PAT KUS Effec LS

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for JS	.093	136	.005	.957	136	.000

a. Lilliefors Significance Correction

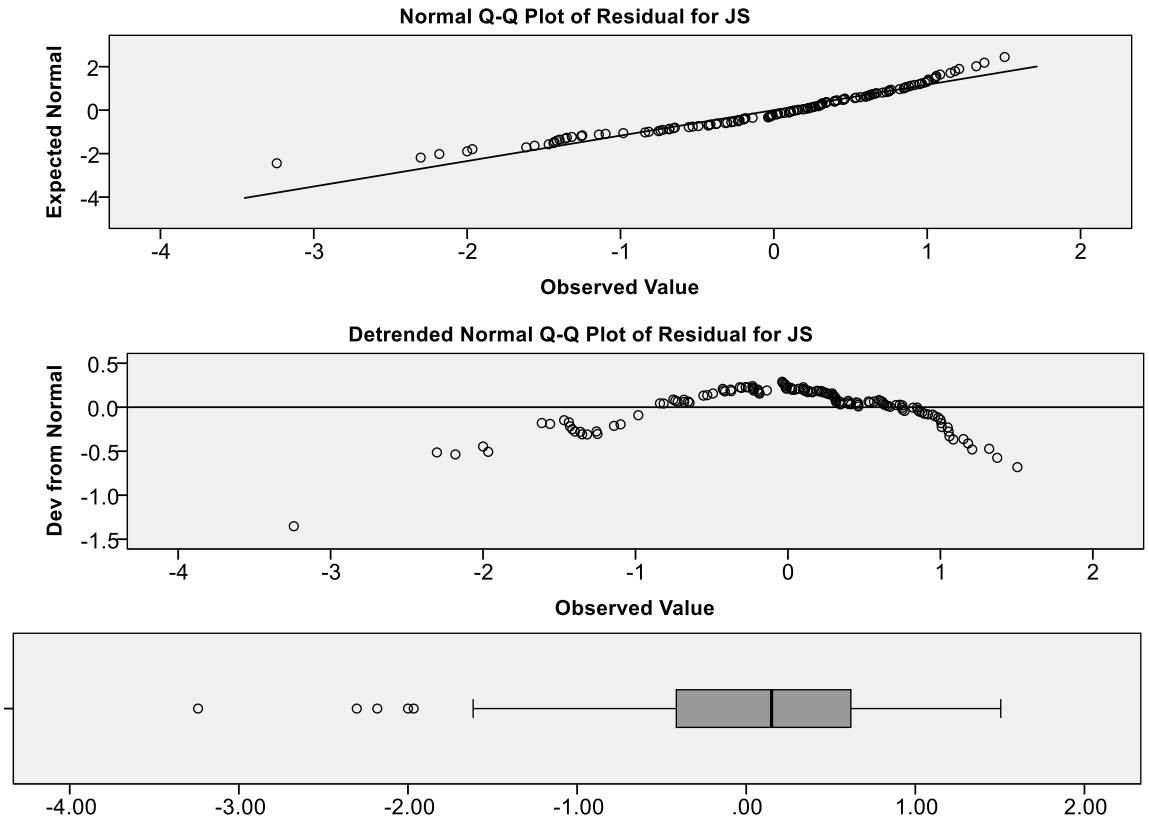


14. JS with PMS PIK KUS Effec LS

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for JS	.117	137	.000	.944	137	.000

a. Lilliefors Significance Correction



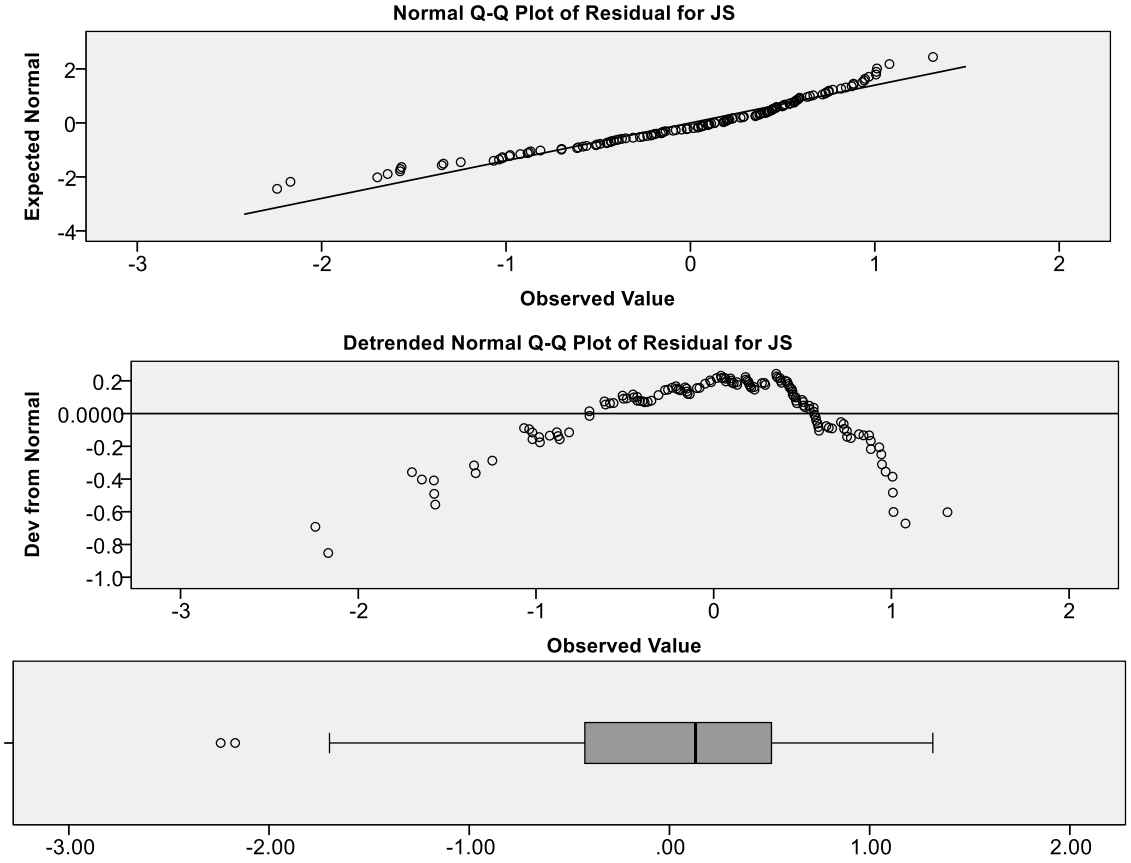
In the test of normality, statistic value for Kolmogorov-Smirnov is above 0.100 and value for Sharpiro-Wilk is below 0.95, the hypothesis test will be calculated with bootstrap methodology.

15. JS with MIS PAT KUS Effec LS

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for JS	.096	136	.004	.948	136	.000

a. Lilliefors Significance Correction



In the test of normality, statistic value for Sharpiro-Wilk is below 0.95, the hypothesis test will be calculated with bootstrap methodology.

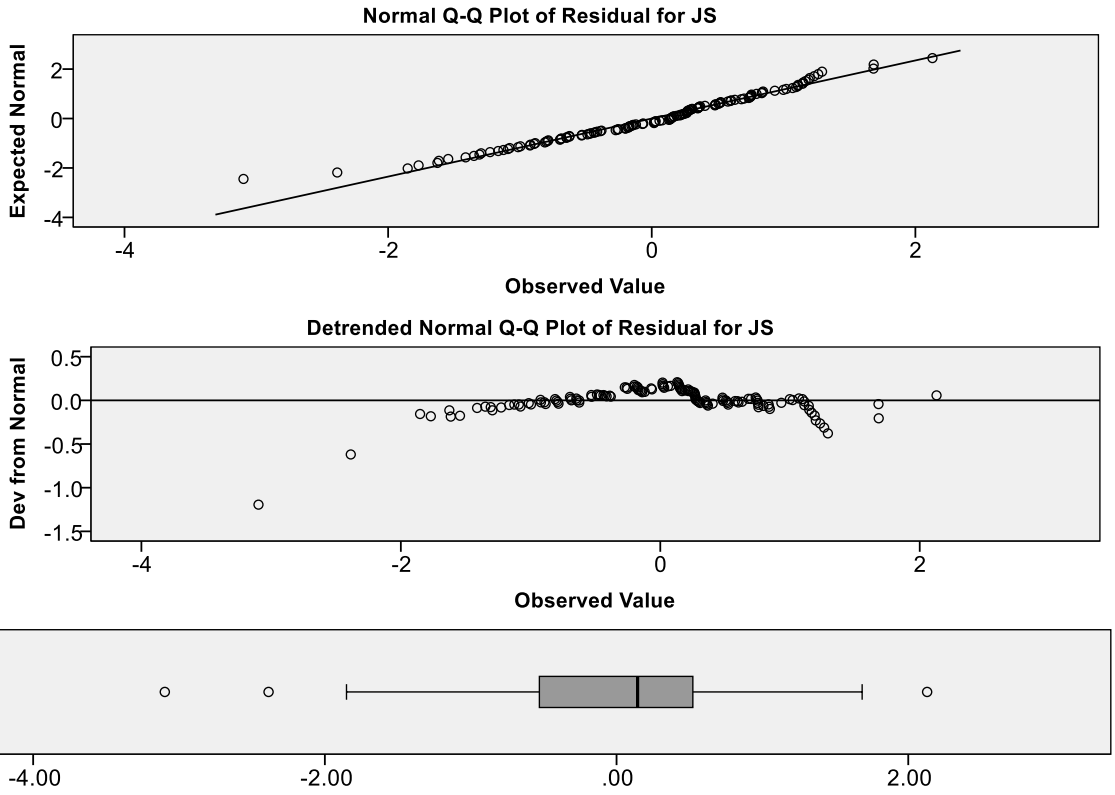
16. JS with MIS PAT KUS Effec LS

JS with MIS PIK KUS Effec LS

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
RES_1 Residual for JS	.086	137	.014	.980	137	.045

a. Lilliefors Significance Correction



Appendix T: Test of hypothesis with UNIANOVA

The following SPSS 22 code was used to test the moderator hypotheses:

Legend: DV: Dependent Variable, IV: Independent Variable, MV: Moderator Variable, CV: Confounder Variable

```
UNIANOVA DV WITH IV MV CV1 CV2 CV3
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /PRINT=PARAMETER ETASQ
  /CRITERIA=ALPHA(.05)
  /DESIGN=IV MV CV1 CV2 CV3 IV*MV.
```

Combinations to be tested are shown in the table with the calculated p values:

DV		IV	MV		CV1	CV 2	CV 3	p
WM	with	PAM	PAT		KUS	Effec		0.113
WM	with	BITA	PAT		KUS	Effec		0.104
WM	with	PMS	PAT		KUS	Effec		**0.049**
WM	with	MIS	PAT		KUS	Effec		0.341
WM	with	PAM		PIK	KUS	Effec		0.657
WM	with	BITA		PIK	KUS	Effec		0.295
WM	with	PMS		PIK	KUS	Effec		0.295
WM	with	MIS		PIK	KUS	Effec		0.353
JS	with	PAM	PAT		KUS	Effec	LS	0.171
JS	with	BITA	PAT		KUS	Effec	LS	0.091
JS	with	PMS	PAT		KUS	Effec	LS	0.294
JS	with	MIS	PAT		KUS	Effec	LS	**0.020**
JS	with	PAM		PIK	KUS	Effec	LS	0.422
JS	with	BITA		PIK	KUS	Effec	LS	0.453
JS	with	PMS		PIK	KUS	Effec	LS	0.942
JS	with	MIS		PIK	KUS	Effec	LS	0.385

For all cases where the significance of IV * MV is $p>0.05$ the following code needs to be executed in order to calculate the main effects:

```
UNIANOVA DV WITH IV CV1 CV2 CV3
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /PRINT=PARAMETER ETASQ
  /CRITERIA=ALPHA(.05)
  /DESIGN=IV CV1 CV2 CV3.
```

Two hypotheses were significant ($p<0.05$) and are therefore tested with PROCESS 4.2 for the conditional effect. The results are shown in Appendix S.

The tables were copied directly from SPSS 22. Therefore the format does not comply with the rest of this research.

1. WM with PAM PAT KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	9.870[a]	5	1.974	8.893	.000
Intercept	10.738	1	10.738	48.380	.000
PAM	.178	1	.178	.803	.372
PAT	.360	1	.360	1.621	.205
KUS	.605	1	.605	2.725	.101
Effec	3.308	1	3.308	14.905	.000
PAM * PAT	.564	1	.564	2.543	.113
Error	33.072	149	.222		
Total	4346.688	155			
Corrected Total	42.942	154			

a. R Squared = .230 (Adjusted R Squared = .204)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	4.594	.660	6.956	.000	3.289	5.899	.245
PAM	-.177	.197	-.896	.372	-.567	.213	.005
PAT	-.206	.162	-1.273	.205	-.525	.114	.011
KUS	.027	.017	1.651	.101	-.005	.060	.018
Effec	.225	.058	3.861	.000	.110	.340	.091
PAM * PAT	.076	.048	1.595	.113	-.018	.170	.017

2. WM with PAM PIK KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	9.223[a]	5	1.845	8.151	.000
Intercept	7.737	1	7.737	34.188	.000
PAM	.037	1	.037	.164	.686
PIK	.024	1	.024	.105	.747
KUS	.421	1	.421	1.862	.174
Effec	3.384	1	3.384	14.954	.000
PAM * PIK	.045	1	.045	.199	.657
Error	33.719	149	.226		
Total	4346.688	155			
Corrected Total	42.942	154			

a. R Squared = .215 (Adjusted R Squared = .188)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	3.923	.671	5.847	.000	2.597	5.249
PAM	.071	.176	.405	.686	-.276	.418
PIK	-.071	.219	-.323	.747	-.504	.363
KUS	.023	.017	1.365	.174	-.010	.056
Effec	.229	.059	3.867	.000	.112	.346
PAM * PIK	.026	.059	.446	.657	-.090	.143

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	3.923	.671	5.847	.000	2.597	5.249	.187
PAM	.071	.176	.405	.686	-.276	.418	.001
PIK	-.071	.219	-.323	.747	-.504	.363	.001
KUS	.023	.017	1.365	.174	-.010	.056	.012
Effec	.229	.059	3.867	.000	.112	.346	.091
PAM * PIK	.026	.059	.446	.657	-.090	.143	.001

3. WM with PAM KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	9.131[a]	3	3.044	13.593	.000	.213
Intercept	46.478	1	46.478	207.573	.000	.579
PAM	1.975	1	1.975	8.819	.003	.055
KUS	.501	1	.501	2.236	.137	.015
Effec	3.634	1	3.634	16.229	.000	.097
Error	33.811	151	.224			
Total	4346.688	155				
Corrected Total	42.942	154				

a. R Squared = .213 (Adjusted R Squared = .197)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	3.680	.255	14.407	.000	3.175	4.184	.579
PAM	.153	.052	2.970	.003	.051	.255	.055
KUS	.025	.017	1.495	.137	-.008	.058	.015
Effec	.234	.058	4.029	.000	.119	.349	.097

4. WM with BITA PAT KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	12.140[a]	5	2.428	11.682	.000	.279
Intercept	12.035	1	12.035	57.906	.000	.277
BITA	.024	1	.024	.116	.734	.001
PAT	.319	1	.319	1.535	.217	.010
KUS	.186	1	.186	.897	.345	.006
Effec	2.198	1	2.198	10.574	.001	.065
BITA * PAT	.555	1	.555	2.670	.104	.017
Error	31.383	151	.208			
Total	4412.938	157				
Corrected Total	43.523	156				

a. R Squared = .279 (Adjusted R Squared = .255)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	4.393	.577	7.610	.000	3.253	5.534	.277
BITA	-.052	.152	-.340	.734	-.352	.249	.001
PAT	-.178	.144	-1.239	.217	-.462	.106	.010
KUS	.015	.016	.947	.345	-.017	.048	.006
Effec	.187	.058	3.252	.001	.073	.301	.065
BITA * PAT	.063	.039	1.634	.104	-.013	.140	.017

5. WM with BITA PIK KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	10.190[a]	5	2.038	9.232	.000
Intercept	11.192	1	11.192	50.701	.000
PMS	.001	1	.001	.004	.952
PIK	.228	1	.228	1.031	.312
KUS	.236	1	.236	1.070	.303
Effec	4.317	1	4.317	19.558	.000
PMS * PIK	.244	1	.244	1.106	.295
Error	33.333	151	.221		
Total	4412.938	157			
Corrected Total	43.523	156			

a. R Squared = .234 (Adjusted R Squared = .209)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	4.191	.589	7.120	.000	3.028	5.354
PMS	.008	.128	.061	.952	-.245	.261
PIK	-.195	.192	-1.015	.312	-.574	.184
KUS	.018	.017	1.035	.303	-.016	.051
Effec	.250	.057	4.422	.000	.139	.362
PMS * PIK	.044	.041	1.052	.295	-.038	.126

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	3.751	.703	5.337	.000	2.363	5.140	.158
BITA	.169	.172	.978	.330	-.172	.509	.006
PIK	-.023	.223	-.104	.918	-.465	.418	.000
KUS	.022	.016	1.334	.184	-.010	.054	.012
Effec	.187	.059	3.189	.002	.071	.303	.063
BITA * PIK	.010	.056	.187	.852	-.100	.121	.000

6. WM with BITA KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	11.400[a]	3	3.800	17.927	.000	.259
Intercept	50.707	1	50.707	239.212	.000	.608
BITA	3.836	1	3.836	18.097	.000	.105
KUS	.431	1	.431	2.034	.156	.013
Effec	2.284	1	2.284	10.776	.001	.065
Error	32.644	154	.212			
Total	4448.938	158				
Corrected Total	44.045	157				

a. R Squared = .259 (Adjusted R Squared = .244)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	3.655	.236	15.466	.000	3.188	4.122	.608
BITA	.205	.048	4.254	.000	.110	.300	.105
KUS	.023	.016	1.426	.156	-.009	.054	.013
Effec	.190	.058	3.283	.001	.076	.304	.065

7. WM with PMS PAT KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	10.907[a]	5	2.181	10.198	.000	.254
Intercept	15.261	1	15.261	71.340	.000	.322
PMS	.200	1	.200	.936	.335	.006
PAT	.542	1	.542	2.532	.114	.017
KUS	.242	1	.242	1.129	.290	.007
Effec	4.179	1	4.179	19.534	.000	.115
PMS * PAT	.843	1	.843	3.940	.049	.026
Error	32.087	150	.214			
Total	4376.938	156				
Corrected Total	42.995	155				

a. R Squared = .254 (Adjusted R Squared = .229)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	4.486	.531	8.446	.000	3.437	5.536	.322
PMS	-.125	.129	-.968	.335	-.380	.130	.006
PAT	-.205	.129	-1.591	.114	-.459	.050	.017
KUS	.018	.017	1.063	.290	-.015	.051	.007
Effec	.246	.056	4.420	.000	.136	.356	.115
PMS * PAT	.062	.031	1.985	.049	.000	.124	.026

8. WM with PMS PIK KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	10.190[a]	5	2.038	9.232	.000
Intercept	11.192	1	11.192	50.701	.000
PMS	.001	1	.001	.004	.952
PIK	.228	1	.228	1.031	.312
KUS	.236	1	.236	1.070	.303
Effec	4.317	1	4.317	19.558	.000
PMS * PIK	.244	1	.244	1.106	.295
Error	33.333	151	.221		
Total	4412.938	157			
Corrected Total	43.523	156			

a. R Squared = .234 (Adjusted R Squared = .209)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	4.191	.589	7.120	.000	3.028	5.354
PMS	.008	.128	.061	.952	-.245	.261
PIK	-.195	.192	-1.015	.312	-.574	.184
KUS	.018	.017	1.035	.303	-.016	.051
Effec	.250	.057	4.422	.000	.139	.362
PMS * PIK	.044	.041	1.052	.295	-.038	.126

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	4.191	.589	7.120	.000	3.028	5.354	.251
PMS	.008	.128	.061	.952	-.245	.261	.000
PIK	-.195	.192	-1.015	.312	-.574	.184	.007
KUS	.018	.017	1.035	.303	-.016	.051	.007
Effec	.250	.057	4.422	.000	.139	.362	.115
PMS * PIK	.044	.041	1.052	.295	-.038	.126	.007

9. WM with PMS KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	9.946[a]	3	3.315	15.107	.000	.229
Intercept	45.237	1	45.237	206.131	.000	.574
PMS	2.746	1	2.746	12.513	.001	.076
KUS	.312	1	.312	1.423	.235	.009
Effec	4.408	1	4.408	20.087	.000	.116
Error	33.577	153	.219			
Total	4412.938	157				
Corrected Total	43.523	156				

a. R Squared = .229 (Adjusted R Squared = .213)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	3.634	.253	14.357	.000	3.134	4.135	.574
PMS	.134	.038	3.537	.001	.059	.209	.076
KUS	.020	.017	1.193	.235	-.013	.053	.009
Effec	.250	.056	4.482	.000	.140	.360	.116

10. WM with MIS PAT KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	9.428[a]	5	1.886	8.426	.000	.219
Intercept	13.531	1	13.531	60.467	.000	.287
MIS	.036	1	.036	.159	.691	.001
PAT	.038	1	.038	.169	.682	.001
KUS	.446	1	.446	1.994	.160	.013
Effec	4.184	1	4.184	18.696	.000	.111
MIS * PAT	.204	1	.204	.913	.341	.006
Error	33.567	150	.224			
Total	4376.938	156				
Corrected Total	42.995	155				

a. R Squared = .219 (Adjusted R Squared = .193)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	4.096	.527	7.776	.000	3.055	5.137	.287
MIS	-.062	.154	-.399	.691	-.366	.243	.001
PAT	-.054	.131	-.411	.682	-.313	.205	.001
KUS	.024	.017	1.412	.160	-.010	.057	.013
Effec	.248	.057	4.324	.000	.135	.361	.111
MIS * PAT	.036	.038	.956	.341	-.039	.112	.006

11. WM with MIS PIK KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	8.946[a]	5	1.789	7.813	.000	.206
Intercept	12.238	1	12.238	53.443	.000	.261
MIS	.022	1	.022	.098	.755	.001
PIK	.088	1	.088	.384	.536	.003
KUS	.532	1	.532	2.323	.130	.015
Effec	4.000	1	4.000	17.469	.000	.104
MIS * PIK	.199	1	.199	.870	.353	.006
Error	34.577	151	.229			
Total	4412.938	157				
Corrected Total	43.523	156				

a. R Squared = .206 (Adjusted R Squared = .179)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	4.232	.579	7.310	.000	3.088	5.376	.261
MIS	-.047	.150	-.312	.755	-.343	.249	.001
PIK	-.112	.180	-.620	.536	-.467	.244	.003
KUS	.026	.017	1.524	.130	-.008	.059	.015
Effec	.243	.058	4.180	.000	.128	.357	.104
MIS * PIK	.043	.046	.933	.353	-.048	.135	.006

12. WM with MIS KUS Effec

Tests of Between-Subjects Effects

Dependent Variable: WM Work Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	8.535[a]	3	2.845	12.441	.000	.196
Intercept	55.183	1	55.183	241.312	.000	.612
MIS	1.335	1	1.335	5.838	.017	.037
KUS	.643	1	.643	2.812	.096	.018
Effec	4.345	1	4.345	19.002	.000	.110
Error	34.988	153	.229			
Total	4412.938	157				
Corrected Total	43.523	156				

a. R Squared = .196 (Adjusted R Squared = .180)

Parameter Estimates

Dependent Variable: WM Work Motivation

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	3.829	.246	15.534	.000	3.342	4.316	.612
MIS	.097	.040	2.416	.017	.018	.176	.037
KUS	.028	.017	1.677	.096	-.005	.061	.018
Effec	.250	.057	4.359	.000	.136	.363	.110

13. JS with PAM PAT KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	67.988[a]	6	11.331	18.741	.000	.468
Intercept	.097	1	.097	.161	.689	.001
PAM	2.623	1	2.623	4.339	.039	.033
PAT	4.906	1	4.906	8.115	.005	.060
KUS	.109	1	.109	.180	.672	.001
Effec	2.040	1	2.040	3.374	.069	.026
LS	5.196	1	5.196	8.594	.004	.063
PAM * PAT	1.145	1	1.145	1.894	.171	.015
Error	77.391	128	.605			
Total	3414.556	135				
Corrected Total	145.379	134				

a. R Squared = .468 (Adjusted R Squared = .443)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	-.486	1.211	-.401	.689	-2.883	1.911	.001
PAM	.735	.353	2.083	.039	.037	1.434	.033
PAT	.831	.292	2.849	.005	.254	1.408	.060
KUS	.014	.032	.425	.672	-.050	.077	.001
Effec	.191	.104	1.837	.069	-.015	.396	.026
LS	.107	.036	2.932	.004	.035	.178	.063
PAM * PAT	-.118	.085	-1.376	.171	-.287	.051	.015

14. JS with PAM PIK KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	50.050[a]	6	8.342	11.201	.000	.344
Intercept	.094	1	.094	.126	.723	.001
PAM	4.739	1	4.739	6.363	.013	.047
PIK	.832	1	.832	1.117	.293	.009
KUS	.061	1	.061	.082	.776	.001
Effec	1.533	1	1.533	2.059	.154	.016
LS	6.094	1	6.094	8.183	.005	.060
PAM * PIK	.484	1	.484	.650	.422	.005
Error	95.329	128	.745			
Total	3414.556	135				
Corrected Total	145.379	134				

a. R Squared = .344 (Adjusted R Squared = .314)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	.469	1.322	.355	.723	-2.148	3.086	.001
PAM	.850	.337	2.522	.013	.183	1.516	.047
PIK	.444	.420	1.057	.293	-.388	1.276	.009
KUS	-.010	.036	-.286	.776	-.081	.060	.001
Effec	.165	.115	1.435	.154	-.063	.393	.016
LS	.115	.040	2.861	.005	.036	.195	.060
PAM * PIK	-.091	.113	-.806	.422	-.314	.132	.005

15. JS with PAM KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	48.586[a]	4	12.146	16.313	.000	.334
Intercept	7.503	1	7.503	10.078	.002	.072
PAM	29.444	1	29.444	39.545	.000	.233
KUS	.020	1	.020	.027	.870	.000
Effec	1.452	1	1.452	1.950	.165	.015
LS	5.393	1	5.393	7.243	.008	.053
Error	96.794	130	.745			
Total	3414.556	135				
Corrected Total	145.379	134				

a. R Squared = .334 (Adjusted R Squared = .314)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	1.617	.509	3.175	.002	.609	2.624	.072
PAM	.635	.101	6.289	.000	.436	.835	.233
KUS	-.006	.035	-.164	.870	-.075	.064	.000
Effec	.159	.114	1.396	.165	-.066	.385	.015
LS	.108	.040	2.691	.008	.028	.187	.053

16. JS with BITA PAT KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	74.246[a]	6	12.374	22.082	.000	.507
Intercept	.170	1	.170	.303	.583	.002
BITA	4.783	1	4.783	8.536	.004	.062
PAT	7.159	1	7.159	12.775	.000	.090
KUS	.099	1	.099	.176	.676	.001
Effec	.795	1	.795	1.418	.236	.011
LS	5.269	1	5.269	9.403	.003	.068
BITA * PAT	1.625	1	1.625	2.901	.091	.022
Error	72.289	129	.560			
Total	3450.556	136				
Corrected Total	146.535	135				

a. R Squared = .507 (Adjusted R Squared = .484)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	-.538	.978	-.550	.583	-2.472	1.396	.002
BITA	.744	.255	2.922	.004	.240	1.247	.062
PAT	.870	.243	3.574	.000	.388	1.351	.090
KUS	.013	.031	.419	.676	-.049	.075	.001
Effec	.120	.101	1.191	.236	-.079	.319	.011
LS	.106	.035	3.066	.003	.038	.175	.068
BITA * PAT	-.112	.066	-1.703	.091	-.242	.018	.022

17. JS with BITA PIK KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	48.256[a]	6	8.043	10.517	.000	.327
Intercept	.161	1	.161	.211	.647	.002
BITA	3.591	1	3.591	4.696	.032	.035
PIK	.922	1	.922	1.205	.274	.009
KUS	.269	1	.269	.351	.554	.003
Effec	.925	1	.925	1.209	.274	.009
LS	8.026	1	8.026	10.495	.002	.075
BITA * PIK	.434	1	.434	.568	.453	.004
Error	99.418	130	.765			
Total	3486.556	137				
Corrected Total	147.674	136				

a. R Squared = .327 (Adjusted R Squared = .296)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	.665	1.450	.459	.647	-2.203	3.534	.002
BITA	.754	.348	2.167	.032	.066	1.443	.035
PIK	.495	.451	1.098	.274	-.397	1.387	.009
KUS	-.022	.037	-.593	.554	-.094	.051	.003
Effec	.130	.118	1.100	.274	-.104	.365	.009
LS	.132	.041	3.240	.002	.051	.212	.075
BITA * PIK	-.085	.113	-.753	.453	-.308	.138	.004

18. JS with BITA KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	45.759[a]	4	11.440	14.817	.000	.310
Intercept	12.148	1	12.148	15.734	.000	.107
BITA	25.316	1	25.316	32.790	.000	.199
KUS	.191	1	.191	.248	.620	.002
Effec	.859	1	.859	1.112	.294	.008
LS	8.095	1	8.095	10.485	.002	.074
Error	101.915	132	.772			
Total	3486.556	137				
Corrected Total	147.674	136				

a. R Squared = .310 (Adjusted R Squared = .289)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	1.966	.496	3.967	.000	.985	2.946	.107
BITA	.553	.097	5.726	.000	.362	.744	.199
KUS	-.018	.036	-.497	.620	-.089	.053	.002
Effec	.124	.117	1.055	.294	-.109	.356	.008
LS	.131	.040	3.238	.002	.051	.211	.074

19. JS with PMS PAT KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	70.047[a]	6	11.674	19.689	.000	.478
Intercept	1.727	1	1.727	2.913	.090	.022
PMS	8.329E-6	1	8.329E-6	.000	.997	.000
PAT	.535	1	.535	.902	.344	.007
KUS	.010	1	.010	.018	.895	.000
Effec	3.189	1	3.189	5.379	.022	.040
LS	6.566	1	6.566	11.074	.001	.079
PMS * PAT	.659	1	.659	1.111	.294	.009
Error	76.488	129	.593			
Total	3450.556	136				
Corrected Total	146.535	135				

a. R Squared = .478 (Adjusted R Squared = .454)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	1.693	.992	1.707	.090	-.270	3.655	.022
PMS	-.001	.235	-.004	.997	-.465	.464	.000
PAT	.220	.232	.950	.344	-.238	.678	.007
KUS	-.004	.033	-.133	.895	-.070	.062	.000
Effec	.229	.099	2.319	.022	.034	.424	.040
LS	.122	.037	3.328	.001	.049	.194	.079
PMS * PAT	.059	.056	1.054	.294	-.052	.171	.009

20. JS with PMS PIK KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	48.587[a]	6	8.098	10.624	.000	.329
Intercept	.798	1	.798	1.047	.308	.008
PMS	2.058	1	2.058	2.700	.103	.020
PIK	.002	1	.002	.003	.956	.000
KUS	1.130	1	1.130	1.483	.226	.011
Effec	5.859	1	5.859	7.686	.006	.056
LS	12.716	1	12.716	16.683	.000	.114
PMS * PIK	.004	1	.004	.005	.942	.000
Error	99.087	130	.762			
Total	3486.556	137				
Corrected Total	147.674	136				

a. R Squared = .329 (Adjusted R Squared = .298)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	1.301	1.271	1.023	.308	-1.214	3.815	.008
PMS	.435	.265	1.643	.103	-.089	.959	.020
PIK	.022	.401	.055	.956	-.772	.816	.000
KUS	-.045	.037	-1.218	.226	-.118	.028	.011
Effec	.309	.112	2.772	.006	.089	.530	.056
LS	.166	.041	4.085	.000	.085	.246	.114
PMS * PIK	.006	.086	.073	.942	-.164	.176	.000

21. JS with PMS KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	48.417[a]	4	12.104	16.097	.000	.328
Intercept	4.132	1	4.132	5.495	.021	.040
PMS	27.975	1	27.975	37.203	.000	.220
KUS	1.091	1	1.091	1.451	.231	.011
Effec	6.316	1	6.316	8.400	.004	.060
LS	12.749	1	12.749	16.955	.000	.114
Error	99.257	132	.752			
Total	3486.556	137				
Corrected Total	147.674	136				

a. R Squared = .328 (Adjusted R Squared = .307)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	1.259	.537	2.344	.021	.197	2.322	.040
PMS	.473	.078	6.099	.000	.320	.627	.220
KUS	-.044	.036	-1.205	.231	-.116	.028	.011
Effec	.317	.109	2.898	.004	.101	.533	.060
LS	.166	.040	4.118	.000	.086	.246	.114

22. JS with MIS PAT KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	77.477[a]	6	12.913	24.121	.000	.529
Intercept	.456	1	.456	.852	.358	.007
MIS	6.626	1	6.626	12.378	.001	.088
PAT	10.773	1	10.773	20.123	.000	.135
KUS	.052	1	.052	.097	.756	.001
Effec	1.806	1	1.806	3.374	.069	.025
LS	2.064	1	2.064	3.856	.052	.029
MIS * PAT	2.973	1	2.973	5.554	.020	.041
Error	69.058	129	.535			
Total	3450.556	136				
Corrected Total	146.535	135				

a. R Squared = .529 (Adjusted R Squared = .507)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	-.786	.851	-.923	.358	-2.470	.898	.007
MIS	.866	.246	3.518	.001	.379	1.353	.088
PAT	.935	.208	4.486	.000	.523	1.347	.135
KUS	.009	.030	.312	.756	-.050	.069	.001
Effec	.173	.094	1.837	.069	-.013	.359	.025
LS	.068	.035	1.964	.052	-.001	.137	.029
MIS * PAT	-.143	.061	-2.357	.020	-.262	-.023	.041

23. JS with MIS PIK KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	49.144[a]	6	8.191	10.807	.000	.333
Intercept	.414	1	.414	.546	.461	.004
MIS	4.021	1	4.021	5.305	.023	.039
PIK	1.367	1	1.367	1.804	.182	.014
KUS	.159	1	.159	.210	.647	.002
Effec	3.253	1	3.253	4.292	.040	.032
LS	2.669	1	2.669	3.521	.063	.026
MIS * PIK	.576	1	.576	.760	.385	.006
Error	98.530	130	.758			
Total	3486.556	137				
Corrected Total	147.674	136				

a. R Squared = .333 (Adjusted R Squared = .302)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	.841	1.138	.739	.461	-1.410	3.092	.004
MIS	.667	.290	2.303	.023	.094	1.240	.039
PIK	.470	.350	1.343	.182	-.222	1.161	.014
KUS	-.016	.036	-.458	.647	-.087	.054	.002
Effec	.231	.112	2.072	.040	.010	.452	.032
LS	.079	.042	1.876	.063	-.004	.162	.026
MIS * PIK	-.078	.090	-.872	.385	-.256	.100	.006

24. JS with MIS KUS Effec LS

Tests of Between-Subjects Effects

Dependent Variable: JS Job Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	45.352[a]	3	15.117	19.846	.000	.280
Intercept	20.153	1	20.153	26.457	.000	.147
MIS	31.700	1	31.700	41.615	.000	.214
KUS	.156	1	.156	.205	.651	.001
Effec	3.686	1	3.686	4.839	.029	.031
Error	116.546	153	.762			
Total	4047.000	157				
Corrected Total	161.898	156				

a. R Squared = .280 (Adjusted R Squared = .266)

Parameter Estimates

Dependent Variable: JS Job Satisfaction

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	2.314	.450	5.144	.000	1.425	3.202	.147
MIS	.473	.073	6.451	.000	.328	.618	.214
KUS	.014	.031	.453	.651	-.047	.074	.001
Effec	.230	.104	2.200	.029	.023	.436	.031

Appendix U: Test of hypothesis for significant Moderator hypothesizes with PROCESS

For significant interactions the PROCESS v4.2(Hayes, 2022b) Procedure (exemplary) for SPSS from Andrew Hayes is used to calculate the conditional effects

```
PROCESS
  y=WM
  /x=BITA
  /w=PAT
  /cov=KUS Effec
  /plot=1
  /decimals=F10.4
  /moments=1
  /boot=5000
  /conf=95
  /model=1.
```

This is the case for the following combinations:

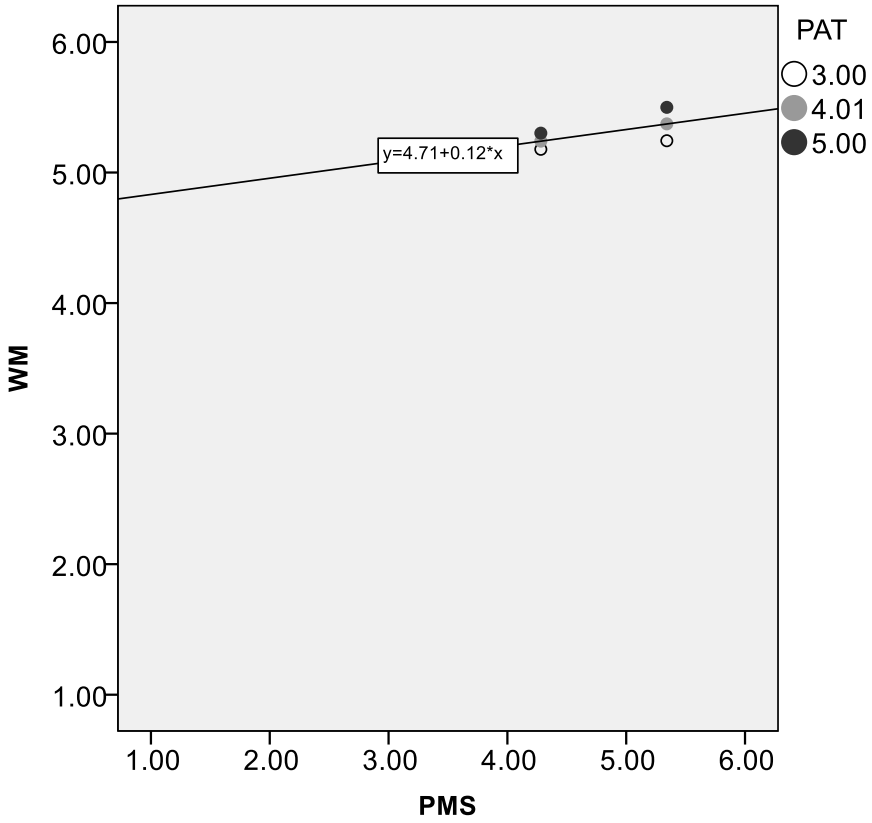
		Sig.
5	WM with PMS PAT KUS Effec	0.049
15	JS with MIS PAT KUS Effec LS	0.020

(5) WM with PMS PAT KUS Effec (p= 0.049)

	Model2		
	B (CI)	p.Eta²	p
icept	4.486	0.322	0.000
PMS	-0.125	0.06	0.335
PAT	-0.205	0.017	0.114
KUS	0.018	0.007	0.290
Effec	0.246	0.115	0.000
PAT*PMS	0.062	0.026	0.049
R^2	0.254		

PAT	B (CI)	p
3.0015	0.062 (-0.038 - 0.162)	0.224
4.0107	0.125 (0.041 - 0.209)	0.004
5.000	0.186 (0.078 - 0.295)	0.001

CI =95%

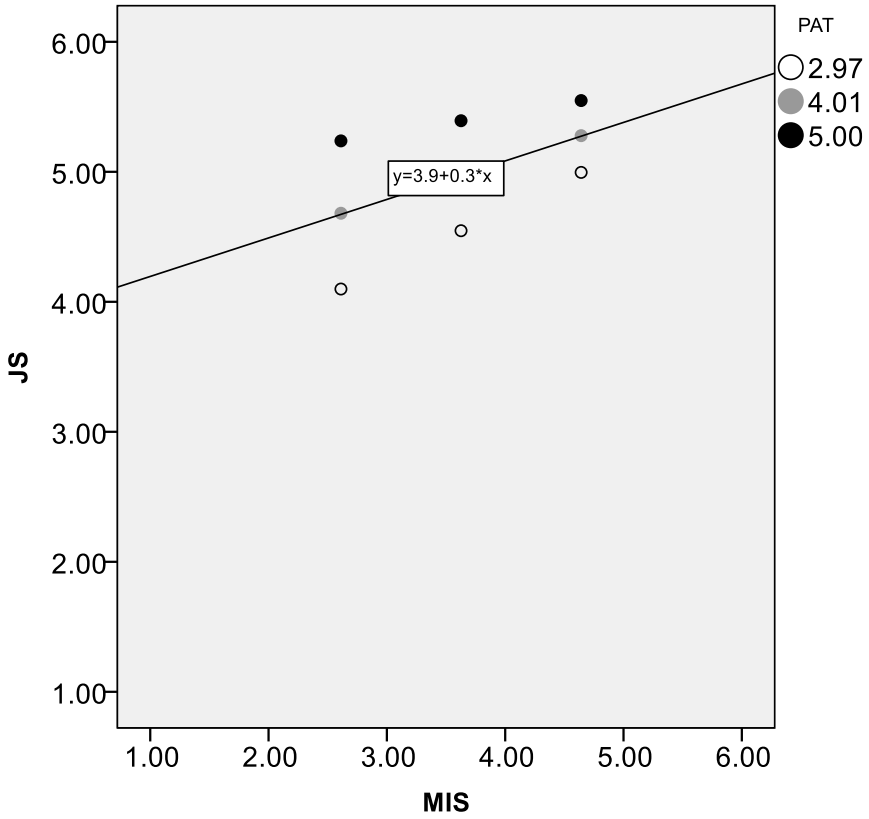


(15) JS with MIS PAT KUS Effec LS (p= 0.020)

	Model2		
	B (CI)	p.Eta²	p
icept	-0.786	0.007	0.358
MIS	0.866	0.088	0.001
PAT	0.935	0.135	0.000
KUS	0.009	0.001	0.756
Effec	0.173	0.025	0.069
LS	0.068	0.041	0.052
PAT*MIS	-0.143	0.041	0.020
R^2	0.529		

PAT	B (CI)	p
2.973	0.4419 (0.2627 - 0.6210)	0.0000
4.010	0.2940 (0.1518 - 0.4361)	0.0001
5.000	0.1527 (-0.0413 - 0.3467)	0.1219

CI =95%


PAT
2.97
4.01
5.00
y=3.9+0.3*x
JS
MIS
6.00
5.00
4.00
3.00
2.00
1.00
1.00
2.00
3.00
4.00
5.00
6.00

Appendix V: Used Software Tools and Websites

Besides books and websites quoted in the reference section and literature databases mentioned in the text, a set of additional software tools and websites were used to support the creation this thesis:

- Microsoft Word 365 for writing this Thesis
- Literature management Citavi 5 and Citavi 6 MS Word and MS PowerPoint plug-in
- Microsoft PowerPoint 365 for creating the figures
- Microsoft Excel 365 for analyzing data and creating the tables
- IBM SPSS 22, and Plugin PROCESS 4.2 for statistical analysis
- IBM SPSS 26 for UNIANOVA bootstrapping analysis
- Survey tool (www.soscisurvey.de last accessed 04.03.2024)
- Google translator (between 2019 and 2024) for translating of originally German text to English text (https://www.google.com/search?client=firefox-b-d&q=google.de+%C3%BCbersetzer last accessed 26.2.2024)
- Deeple translator (between 2019 and 2024) for translating of originally German text to English text (https://www.deepl.com/de/translator last accessed 26.2.2024)
- Grammarly word plug-in for correcting spelling and grammar and rephrasing sentences. (https://www.grammarly.com/)
- ChatGPT between 2023 and 2024 for translating of originally German text to English text, spellchecking, grammar checking. (https://chat.openai.com/ last accessed 26.2.2024)

The Thesis was checked for plagiarism by the author with the following tools:

- PlagScan by Turnitin (https://www.plagscan.com/de/ last accessed 26.2.2024)
- Copyleaks.com (https://app.copyleaks.com last accessed 26.2.2024)