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**INFLUENCE OF A LEADER AS A COACH AND AGILE
WORK PRACTICE ON
AGILE TRANSFORMATION IN COMPANIES**

DOCTORAL THESIS

Submitted for the Scientific Doctor's Degree (*Ph.D.*) in Economics and Business

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CONTENT

<i>List of tables</i>	4
<i>List of figures</i>	5
<i>Annotation</i>	6
<i>Introduction</i>	7
1 THE THEORETICAL ASPECTS OF LEADERSHIP TYPE, AGILE WORK PRACTICE AND AGILE TRANSFORMATION	14
1.1 <i>Leadership type in the organizational culture</i>	14
1.1.1 <i>Description of leadership types</i>	14
1.1.2 <i>Theoretical analysis of leadership type in companies' culture</i>	23
1.2 <i>Theoretical analysis of agile work practice in companies</i>	30
1.2.1 <i>Agile work practice in companies</i>	31
1.2.2 <i>Agile methodological approach</i>	35
1.2.3 <i>Agile approach versus classical approach of the work practice in projects</i>	41
1.3 <i>Theoretical analysis of agile transformation</i>	46
1.3.1 <i>Transformation concepts</i>	47
1.3.2 <i>The direction of agile transformation</i>	51
1.3.3 <i>Influencing characteristics of agile transformation</i>	58
2 THE ACTUAL STATE OF LEADERSHIP IN COMPANIES WHICH ARE IN AGILE TRANSFORMATION	62
2.1 <i>Status quo of agile transformation in companies</i>	63
2.2 <i>Agile work practice and agile transformation in companies</i>	71
2.3 <i>Influence of leadership type on agile transformation</i>	79
3 EMPIRICAL EVALUATION OF THE IMPACT OF LEADERSHIP TYPE AND AGILE WORK PRACTICE IN A PROCESS OF AGILE TRANSFORMATION	87
3.1 <i>Development of research dependency model between leadership type, agile work practice and agile transformation</i>	87
3.2 <i>Mixed methods research</i>	90
3.3 <i>Specialist interviews on definition of agile transformation and research dependency model</i>	92
3.4 <i>Evaluation of employees' survey in quantitative research</i>	100
3.5 <i>Statements of hypothesis and thesis for defense testing</i>	127
3.6 <i>Conceptual model for companies</i>	129
<i>Conclusions</i>	131
<i>Suggestions for companies</i>	135
<i>Bibliography</i>	138

<i>Acknowledgements</i>	150
<i>APPENDIX</i>	151
<i>Appendix 1. Specialist interview in German and English</i>	152
<i>Appendix 2: Quantitative survey in German and English</i>	153
<i>Appendix 3: Results of regression models</i>	162

List of tables

<i>Table 1: Description of Scrum Roles and their responsibilities</i>	38
<i>Table 2: Description of Scrum Artefacts and their description</i>	38
<i>Table 3: Failure causes and barriers to agile adoption in percent in comparison 2015-2020</i>	69
<i>Table 4: Barriers of employees and leadership that hinder Agile Transformation</i> .	83
<i>Table 5: List of interviewed specialists in companies</i>	94
<i>Table 6: The number of employees of selected companies</i>	101
<i>Table 7: Background variables in a framework of general questions</i>	103
<i>Table 8: Main indicators of descriptive statistics for all variables</i>	104
<i>Table 9: Factor loadings of variables</i>	109
<i>Table 10: Main indicators of descriptive statistics for groups by using factor analysis</i>	114
<i>Table 11: Data on variables about agile experience</i>	116
<i>Table 12: Results of regression analysis for dependent variable A change that is outside of my area of responsibility is difficult to implement; obstacles arise</i>	117
<i>Table 13: Results of regression analysis for dependent variable The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success</i>	119
<i>Table 14: Results of regression analysis for dependent variable The introduction of agile values and methods have improved team collaboration</i>	120
<i>Table 15: Results of regression analysis for dependent variable The agile approach has improved</i>	122
<i>Table 16: Results of regression analysis for dependent variable The goal of agile transformation is understandable</i>	123
<i>Table 17: Results of regression analysis for dependent variable Agile methods and the agile way of working are seen as useful</i>	124
<i>Table 18: Conditional effects for different values of the moderator agile work practice</i>	125
<i>Table 19: Results of regression analysis for dependent variable You can actively help to shape the agile transformation</i>	126

List of figures

<i>Figure 1: Leadership influence and dependencies on the organizational performance</i>	20
<i>Figure 2: Interaction of the influencing corporate elements to create agility</i>	21
<i>Figure 3: Structure model of the terms in the context of culture definition based on Hofstede</i>	27
<i>Figure 4: Cultural attributes of the organization divided in visible and invisible</i>	28
<i>Figure 5: Agile scaling based on the existing characteristics in companies</i>	34
<i>Figure 6: Structure and set-up of roles and scrum elements in the project realization based on Schwaber & Sutherland</i>	37
<i>Figure 7: Structural differences of the waterfall model and agile model</i>	45
<i>Figure 8: Agile approach beginning by agile values to agile realization</i>	52
<i>Figure 9: Process of a transformational change</i>	54
<i>Figure 10: Six influencing characteristics of agile transformation in companies</i>	59
<i>Figure 11: Benefits as measurable factors resulting from agile transformation. Comparison 2016 & 2018</i>	67
<i>Figure 12: Success outcomes from an agile transformation in comparison 2017 & 2019</i>	68
<i>Figure 13: Dependency model between leadership type, agile work practice and agile transformation</i>	88
<i>Figure 14: Rough procedure of the empirical research</i>	90
<i>Figure 15: The coherences of the main thesis blocks</i>	91
<i>Figure 16: The procedure framework of quantitative approach</i>	92
<i>Figure 17: Leadership matrix developed after specialist interview evaluation</i>	96
<i>Figure 18: Research dependency model between leadership type and agile transformation</i>	99
<i>Figure 19: Scree plot of leadership type</i>	109
<i>Figure 20: Histogram of predictor variable „leadership type“</i>	112
<i>Figure 21: Cluster analysis: Dendrogram using Ward Linkage</i>	113
<i>Figure 22: Conceptional model for companies</i>	130

Annotation

This doctoral thesis focuses on the influence of a leader as a coach and agile work practice on agile transformation. The aim of the doctoral thesis is to ensure characteristics of leadership types and agile work practice in the agile transformation framework in big companies and to determine the influence of predominantly leader as a coach and agile work practice to agile transformation. The main hypothesis is as follows: consideration of a leader predominantly as a coach and agile work practice influences the agile transformation in companies.

Referring to the literature review that is describing the theoretical analysis in a comparative approach of leadership type, agile work practice, agile transformation and semi-structured specialist interviews in the qualitative research, a research dependency model has been developed. This dependency model is based on the relationship between leadership types, agile work practice and agile transformation.

The robustness of this dependency model has been tested with a mixed methods approach by collecting qualitative and quantitative data. The structured questionnaire in the quantitative research is based on comparable questions applying a 5-point-likert-scale as well as an inquiry of personal and key company data. With this questionnaire employees were interviewed.

By writing the thesis a scientific contribution to knowledge and practice-oriented goal is pursued. The scientific knowledge lies in the conceptualization of agile transformation with a focus on the coach as a leader and agile work practice in relation to agile transformation. The insights gained from this can provide the practice with explanatory patterns as to which factors need to be considered when deciding to use an agile approach in a company. This can provide hints and instructions for action. The chapter contains a discussion and an interpretation of the results at the end, which provides content for conclusions and suggestions. This doctoral thesis contains 149 pages, 22 figures, 19 tables and in total 186 sources used as references.

Keywords: big companies, agile transformation, leadership types, coach as a leader, agile work practice, autocratic leader

Introduction

Actuality of the topic

The world is getting faster, and more complex and traditional practices can no longer compete in companies. Shifting the economic forces, accelerated urbanization, technological breakthroughs therefore present today's companies with unprecedented challenges.

The increasing speed at which markets, products, technologies and subsequently also business models change, means that a company's ability to change becomes a critical success factor.

A constantly changing market situation and the accompanying trend towards digitalization demand from companies a high degree of flexibility continuous adaptation and optimization of their strategy and its implementation.

The required level of flexibility and adaptability is not enough to transform only a business unit. Rather a company-wide agile transformation must ensure that all business units, from the definition of a business strategy to operational implementation work in an agile manner.

When it comes to becoming a more agile company with a high level of agility, company leaders crucial above all. A leader needs a lot of courage and foresight to start a change early enough, a change that questions the existing processes and deals with new business models based on agile transformation and thus allows to remain successful in the medium and long term.

Leadership means a very important part for the agile transformation and plays the main role in the implementation and takes care of sustainability. In addition, leadership means not only limiting oneself to the methodological and business topics but initiating the necessary cultural change with a changed mindset and being open to the challenges that arise.

Traditional organizations are not designed for the dynamic development of the changing economy today. The following study shows the direct connection between agility and success: Agile companies achieve above-average margins up to five times more often and grow faster than their competitors. Over 40% of all agile companies are top performers, only 24% develop below average. In the case of rather sluggish organizations, on the other hand, the

risk of being at the bottom is increased: more than half of the rigid organizations develop below average. Only 18% of them are above average success¹.

The transformation process aims to increase the sensitivity of companies to signals of change in their environment and their ability to respond to them proactively, quickly, and flexibly, so that they can master the market challenges and stay competitive with a change process.

At the same time, however, the agile transformation of companies is a prerequisite for them to be able to master the challenges resulting from the digital transformation. The agile transformation of companies is a complex change process because, in addition to the level of technology/manufacturing processes, it also includes the structural processes and cultural levels. It also requires changes in attitude and behavior from all those directly and indirectly.

Barriers to agile transformation are multifaceted, organizational cultural issues and general resistance to change should be considered significant impediments to full transition and achievement of sustainable organizational agile work practice.

By writing the thesis a scientific contribution to a knowledge and practice-oriented goal is pursued. The scientific knowledge lies in the conceptualization of agile transformation with a focus on leadership type and organizational cultural prerequisites in relation to agile work practice. The insights gained from this can provide practice with explanatory patterns as to which factors need to be considered when deciding to use an agile approach in a company. This can provide hints and instructions for action.

Aim

The aim of the doctoral thesis is to ensure characteristics of leadership types and agile work practice in the agile transformation framework in big companies and to determine the influence of predominantly leader as a coach and agile work practice to agile transformation.

Tasks

In order to accomplish this aim; the following research tasks were stated:

- to analyze the theoretical aspects of agile transformation, agile work practice and leadership types in organizational culture.

¹ Fabrice, R., Scholz, S., Schudey, A.: Organisation im 21. Jahrhundert. Eine Studie identifiziert sechs Erfolgsfaktoren, Zeitschrift Führung und Organisation. 86 (4), 2017, p. 244-249

- to analyze former agile transformation attempts of companies, their mistakes and success stories.
- to analyze existing studies about agile transformation, agile work practice and existing leadership type in companies.
- to create dependency research model and to check it.
- to determine the influence of leadership types and agile work practice on agile transformation.
- develop a conceptual framework for companies.
- to identify criteria as enablers of agile transformation and provide suggestions.

Main hypothesis and thesis for defense

Main hypothesis:

Consideration of a leader predominantly as a coach and agile work practice influences the agile transformation in companies.

Theses to be defended:

1. Leadership type, agile work practice and agile transformation can be defined and measured by characteristics.
2. Leader predominantly as a coach fits the agile transformation.
3. A clear relationship between agile work practice and agile transformation exists.
4. One leadership type has influence on the relationship between agile work practice and agile transformation.

Research object

Selected commercial manufacturing German companies with employee amount over 48.000 worldwide.

Research subject

Leader as a coach and agile work practice and their influence on agile transformation.

Novelty

- a. Leadership types and agile work practice in the agile transformation framework are defined and measured by characteristics.
- b. Leadership types with regard to agile transformation in companies above 48.000 employees are defined.
- c. Quantitative and qualitative research of the relationship between leadership type, agile work practice and agile transformation were carried out.
- d. Developed dependency model to show the relationships between leadership type, agile work practice in the agile transformation framework.
- e. The conceptual model based on research dependency model and on quantitative and qualitative results is created as a recommendation for big companies.

Methodology

From a theoretical perspective state of the art scientific literature concerning the following subjects has been reviewed: leadership type in the organizational culture, analysis of agile work practice, methodological approach, agile approach vs. classical approach, analysis of agile transformation, transformation concepts, implementing agile transformation.

Grounded on literature review and a hereafter empirical analysis of conditions, status quo and demands, the doctoral thesis is following an exploratory approach. Referring to the literature review and semi-structured specialist interviews, a research dependency model has been developed. The robustness of this dependency model has been tested with questionnaires for relevant leaders, overall, a mixed methods approach has been used. This shows that qualitative and quantitative data was collected. The research methods were semi-structured specialist interviews and structured questionnaires. Semi-structured contents open- and closed-ended questions, with a view to determine the status quo of the agile transformation as well as to define leadership type.

All specialist interviews were carried out on the phone and during teams meeting. The beginning of the interviews was followed by structural and open questions and finalized by enquiring data about the companies.

After the finishing the semi-structured specialist interviews, analyzing and evaluating those, the results are the operationalized definition of leadership type. Based on this definition, the research dependency model is further advanced and taken as basis for the development of the structured questionnaire. The structured questionnaire contains structured questions based on comparable questions applying a 5-point-likert-scale as well as an inquiry of personal and key company data. With this questionnaire employees were interviewed via forms. The solution from factor analysis was used to test the hypotheses. Exploratory factor analysis by principal axis factoring, following the recommendations of Costello and Osborne ² and Hair, J. et al.³ were used to investigate the correlative structure of the independent variables in order to find out if a combination of variables could be used to identify different leadership types in companies. In order to identify groups of answering persons, defined by leadership type, exploratory cluster analysis was performed (Ward method with squared Euclidian distance). These analyses were performed using separate regression models with independent variables and with dependent variable. In the quantitative research of this thesis were used following multivariate analysis methods: cluster analysis, factor analysis and regression analysis. The procedure of Regression was done by using IBM SPSS Statistics. The results of the regression analysis are at the end of the chapter.

Structure of the doctoral thesis

This thesis is divided into three main chapters.

The first chapter is describing the theoretical analysis in a comparative approach of leadership type, agile work practice und agile transformation. This chapter has three major topics: The theoretical analysis of leadership type in the organization, theoretical analysis of agile work practice and theoretical analysis of agile transformation.

The second chapter outlines und summarizes the already existing studies about agile transformation in companies. The second chapter also analyzes barriers and challenges determining how far is the agile approach established in companies.

The third chapter contain the empirical part. The chapter starts with the qualitative research and focuses on semi-structured specialist interviews and details the results of how specialists

² Costello, A. B., Osborne, J. W.: Exploratory Factor Analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, and Evaluation*, 10 (7), 2005, pp.1-9

³ Hair, J. F., Black, W. C., Babin, B. J., Anderson R. E.: *Multivariate data analysis*. Harlow: 7th Edition. Pearson Education Limited, 2014

define leadership type and agile transformation in their companies. To define leadership type and agile transformation, the literature review has been consolidated with the results of the specialist interviews. The results from the qualitative research are presented and give the base for quantitative research, including the outcomes from the statistical analyses relating to the verification of the hypotheses. Additionally, the data collection and analyses are described, and the research participants are presented. The chapter concludes with a discussion and interpretation of the results and with this provides content for conclusions and suggestions.

Approbation of Results of Research

International Scientific Conferences

1. Janowski, N.: “Empirical Evaluation of Agile Transformation with regard to influencing Factors”, 80th International Scientific Conference of the University of Latvia, Conference section "Impact of Globalization to National Economies and Business", January 27th 2021, Riga, the Republic of Latvia.
2. Janowski, N.: „Agile Transformation in Cooperations“, International Academic Conference on Economics, Management and Marketing with cooperation of Czech Technical University, August 11th -13th 2019, Cesky Krumlov Czech Republic.
3. Janowski, N.: „Agile Transformation in Cooperations. The structure of corporate culture“, International Academic Conference on Economics, Management and Marketing, August 8th- 10th 2019, Prague Czech Republic.
4. Janowski, N.: „Agile Transformation“, International Scientific Conference for Ph.D. Students of EU countries, CER Comparative European Research. Science, March 25th- 27th, 2019, London England.
5. Ryskulova, N.: „Leadership Style and Corporate Management“, International Academic Conference on Management, Economics, Business and Marketing, November 24th - 25th, 2017, Vienna, Austria.
6. Ryskulova, N.: „Leadership Style and Corporate Managemen “, International Masaryk Conference for Ph.D. Students and Young Researchers, December 18th – 20th, 2017, Hradec Královo Czech Republic.

Publications

1. Janowski, N.: „Empirical Evaluation of the Impact of Leadership Type in a process of Agile Transformation“ in the Journal of Economics and Management Research, Volume 10, 2021, ISSN 2255 – 9000, pp. 21-32.
2. Janowski, N.: „Agile Transformation by Leadership and Agile Work Practice in Companies“, International Masaryk Conference for Ph.D. Students and Young Researchers.“ Volume 12, Dezember 2021, ISBN 978-80-87952-35-1, pp. 49-61.
3. Janowski, N.: “Agile Approach Versus Classical Approach in Project Management with Regard to Leadership Change“ in the Journal Humanities and Social Sciences: Latvia, Volume 29, Issue 1, Spring-Summer 2021, ISSN 1022-4483, pp. 114-133.
4. Janowski, N.: “Agile Transformation in Cooperations“ in the international Academic Conference on Economics, Management and Marketing with cooperation of Czech Technical University in Cesky Krumlov Czech Republic, 2019, ISBN 978-80-88085-25-6, pp. 13-18.
5. Janowski, N.: “Agile Transformation in Cooperations. The structure of corporate culture“ in International Academic Conference on Economics, Management and Marketing, Prague Czech Republic, 2019, ISBN 978-80-88085-24-9, pp. 22-28.
6. Janowski, N.: “Agile Transformation“in CER Comparative European Research. International Scientific Conference for Ph.D. Students of EU countries, London England, Science 2019, ISBN 978-1-9993071-2-7, pp. 11-15.
7. Ryskulova, N.: “Leadership Style and Corporate Management “in International Masaryk Conference for Ph.D. Students and Young Researchers, Hradec Královo Czech Republic, 2017, ISBN 978-80-87952-22-1, pp. 75-83.

1 THE THEORETICAL ASPECTS OF LEADERSHIP TYPE, AGILE WORK PRACTICE AND AGILE TRANSFORMATION

The first chapter gives a definition for the term's leadership type, agile work practice and agile transformation and aims the theoretical analysis in a comparative approach of leadership type, agile work practice und agile transformation.

1.1 Leadership type in the organizational culture

This first part of this chapter aims to define terms and explain the modern leadership types in a company, the connection between leadership and organizational culture is explained in more detail along with the definition of the culture term. It also examines the influence of leadership type on agile work practice and on the agile transformation of a company.

Leadership and company culture are strongly connected. Leaders are able to establish a new culture or at least shape the existing one. For this reason, the term leadership and leadership type must be defined precisely in a frame of organisational culture. The literature research in this chapter focuses on the leadership types that are particularly strongly represented in the context of agile transformation.

1.1.1 Description of leadership types

Leadership is a reciprocal, result-oriented, unstable object of giving and receiving, of expecting and fulfilling. These are always political processes, because leadership stands not just only for neutral psychosocial soft facts such as relationships, behaviours, feelings, motivation, climate, shared successes, but for interests, power, counter-power, dependencies, and sovereignty as well⁴.

According to Sohm, leadership includes the following elements⁵:

- Because leadership is dynamic and in constant process, it cannot be rigid or contain rigid properties.

⁴ Rieckmann, H.: Führungskraft und Management Development. München: Gerling-Akad.-Verl, 2000, p. 54

⁵ Sohm, S.: Zeitgemäße Führung – Ansätze und Modelle: Eine Studie der klassischen und neueren Management-Literatur. Gutersloh: Bertelsmann Stiftung, 2007, p. 2-4

- Leadership is expressed in influencing other people who have an interpersonal relationship with each other.
- Leadership can only take place in a group, where emotions and feelings also find their place.
- A goal is set and must be achieved together. For this reason, the leader is authorized as a function.

In the leadership concept of leadership, organizations with a high need for change are assigned a leadership type that is endowed with a transformational characteristic. It is particularly appropriate in situations in which leaders cannot assess the work or solution approaches of their employees in detail, for example due to specialist knowledge or also in the context of quick decision-making⁶.

According to Kotter⁷ effective manager is about giving employees an understanding of why a change process is necessary and what organizational benefits are derived from it⁸. So that everyone understands why certain processes are being carried out, just as complex as a change process. The change process is now a constant feature of companies, but employees do not understand the change and are therefore not behind it.

When looking at change leadership literature, there are different leadership types and leadership theories. However, the author would in context of this thesis choose a leadership type in that offer the highest input for agile transformation. For this reason, transformational leadership will be discussed in this thesis.

Studies by Castiglione and Jantz highlighted transformational leadership, which it was found to be more effective than laissez-faire or transactional leadership^{9,10}.

Bass believes that the actions of transformational leaders focus more on organizational interests and put their own interests in the background. The transformative leader is respectful, confident, is clear in acting and thinking and also clearly communicates the goals. Leader

⁷ Kotter, J. P., Cohen, D. S.: *The heart of change: real-life stories of how people change their organizations*. Boston, MA: Harvard Business School Press. 2002

⁸ Burnes, B.: Kurt Lewin and the Planned Approach to Change: A Re-appraisal *Journal of Management Studies* 41(6), 2004, pp. 979-980

⁹ Castiglione, J.: Organizational learning and transformational leadership in the library environment. *Library Management*, 27 (4/5), 2006, pp. 289–299

¹⁰ Jantz, R. C.: Innovation in academic libraries: An analysis of university librarians' perspectives. *Library and Information Science Research*, 34 (1), 2012, p. 3–12

involves employees and supports the innovation process or the willingness to try new things. This type of leader does not forget to support the learning and development process of the employee¹¹.

According to Kouzes and Posner 2012 the transformational leader achieves the highest level of performance and variation in the change process by interweaving the 4 levels¹², by means of four dimensions:

1. “Idealized influence”.
2. “Inspirational motivation”.
3. “Intellectual stimulation”.
4. “Individualized consideration”.

These behaviours were reflected in Caulfield and Senger’s schema for ideal leadership qualities:

- a) inspiring communicator,
- b) honesty,
- c) competency,
- d) inclusivity,
- e) respect,
- d) competent decision-making¹³.

Bass and Riggio define transformational leadership as “inspiring followers to commit to a shared vision and goals for an organization or unit, challenging them to be innovative problem solvers, and developing followers’ leadership capacity via coaching, mentoring, and provision of both challenge and support”¹⁴. A transformational leader uses skills to inspire by vision and to motivate by individual appreciation.

This integrative understanding is already in the traditional concept of transformational lead-

¹¹ Bass, B. M.: From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics*, 18 (3), 1990, pp.19–31

¹² Kouzes, J. M., Posner, B. Z.: *The leadership challenge: How to make extraordinary things happen*. San Francisco, CA: Jossey-Bass, 5, 2012

¹³ Caulfield, J. L., Senger, A.: Perception is reality: Change leadership and work engagement. *Leadership and Organization Development Journal*, 38 (7), 2007, pp. 927-930

¹⁴ Bass, B., Riggio, R.: *Transformational leadership* Mahwah, NJ: Lawrence Erlbaum Associates, Publishers, 2006, p. 4

ership. It also requires leadership communication that is professionally designed from a strategic and operational point of view. In the context of agile work practice, however, a new strong frame of reference for the consideration of leadership communication emerges as part of the expanded, transformatory leadership style, which deals with the communication of "resilience".

Not only the transformational leader but also the servant leader can lead the organization and the team through the change process.

Overstreet et al. further explained in what way elements of servant leadership theory and social exchange theory can ultimately impact performance by developing organizational commitment via servant leadership behaviours¹⁵. The servant leader aims to motivate employees and the servant leader also aims to develop employees. Above all, it is about personal and professional development as the exclusive achievement of his goals. The servant leader as the word "servant" impacts the occurrence to serve.

The servant leader builds on trust and a commitment culture in an organization. Servant leader aims to motivate the employees, also the servant leader aims to develop the employees. Above all, it is about personal and professional development rather than the exclusive achievement of his goals¹⁶.

The leadership theories that underlay the study also encompass theories of transformational leadership and servant leadership as important components of support in changing and shaping organizational culture.

The servant leader offers a new approach to being a leader, one that is not classically seen in front. The servant leader is understood more as a servant who stands behind his employees and lets them be creative and let them free working spaces. The servant leader is increasingly appearing in the start-up culture and in the IT area of traditional companies. Where creativity is increasingly required, it is controversial to think and act hierarchically. But it is precisely this leadership type that would be an opportunity for renewal in the big companies.

¹⁵ Overstreet, R. E., Hazen, B. T., Skipper, J. B., Hanna, J. B.: Bridging the gap between strategy and performance: Using leadership style to enable structural elements. *Journal of Business Logistics*, 35 (2), 2014, pp. 136

¹⁶ Liden, E. C., Wayne, S. Y., Thao, H., Henderson, D.: Servant Leadership: Development of a multidimensional measure and multilevel assessment. *The Leadership Quarterly*, 19 (2), 2008, pp. 161-177

Another style of leadership reflects and supports the agile way of working and is also important component of support in changing and shaping organizational culture.

Coaching is describing as a “vehicle” that helps to go faster from one point to another. So coaching is defined as a process of helping or supporting one person or a project team by some advice. Jo Manion has following arguments for a coach: “encouraging discovery through guided discussions and hands-on experience; observing performance; and giving honest, direct, and immediate feedback”¹⁷.

Companies educate and train their leaders to develop coaching skills and to have it like a leader`s toolkit¹⁸. But this mean that not every leader passes the adaptation of coaching skills in the position. So, after the training it is a common way to fall to the common und usual command and control leadership style¹⁹. So, the change can`t happen overnight because the behavior is part of a cultural change. Every change and especially cultural change needs time and effort²⁰.

Some of the dynamics of leadership in coaching have the following interpretation “leadership as an influence process in which leaders provide purpose, direction, and motivation to operate and improve the organization”²¹.

The leader as a coach has become quite widespread in companies and is used at many management levels. The coach leaves the employee a degree of freedom but can always intervene in a coaching capacity and thus optimize the employee's work. The coach suggests a hierarchy-free character, but not to the full extent, because the coach leads thematically and hierarchically.

The opposite of the leadership style “servant leader” and “coaching leader” is to be an autocratic leader. So, an autocratic leader is defined as follow: “autocratic leader is commonly interpreted as a person with unlimited power or authority. Absolute power of the leaders over their employees or group commonly characterizes the leadership style in wide range of

¹⁷ Manion, J.: The Leader as coach. *Journal of PeriAnesthesia Nursing*, 30 (6), 2015, pp. 548-552

¹⁸ Goleman, D.: Leadership that gets results. *Harvard Business Review*, 2000, pp. 78-90

¹⁹ Prochaska, J. O., Velicier, W. F., Rossi, J. S., Goldstein, M. G.: Stages of change and decisional balance for 12 problem behaviors. *Health Psychology*, 13 (1), pp.39-46, Manion, J.: The Leader as coach. *Journal of PeriAnesthesia Nursing*, 30 (6), 2014, pp. 276-288

²⁰ Grant, A. M.: It takes time: A stages of change perspective on the adoption of workplace coaching skills. *Journal of Change Management*, 10 (1), pp. 62-64

²¹ Ruvolo, C., Petersen, S., LeBoeuf, J.: Leaders are made, not born. *Consulting Psychology Journal: Practice and Research*, 56 (1), 2004, p. 10-19

literature. The autocratic leader may employ coercion, exploitation or even intimidation to achieve their goals”²².

So, in the common industry there are still existing autocratic leaders. Of course, the autocratic leader has their own advantages and for this reason also find their legitimation. This leadership style can be successful in an area where people don't need special skills and follow the orders and accept detail instruction to finish the work. Also, to make a quick decisions autocratic leader can be an advantage.

Flamholtz (1990) gives following description to autocratic leadership.

- Autocratic – A decision has to be taken by a leader only.
- Benevolent-autocratic – A leader thinks that only he/she knows the best way to work and to take decisions.
- Participative – Employees work together and work out the decision, but the “last word” takes the leader.
- Consensual - Employees and leader takes an alignment²³.

Goleman means authoritative leader takes a “come with me” approach²⁴. Goal is the crucial element. This type is useful when business is a drift.

According to Denning every change and the switch of the entire company to the agile approach also requires the transformation of corporate culture, and this is a largescale and difficult mission. Denning noticed that a successful strategy for the agile transformation begins by “leadership tools, including a vision or stories of the future, [which] cement the change in place with management tools, such as role definitions, measurement, and control systems, and use the pure power tools of coercion and punishments²⁵ as the last resort”²⁵.

According to Denning in order to be able to change the corporate culture it is necessary to inspire as a leadership employee and above all communication is crucial. To explain and communicate the goals as well as the processes is crucial for changing culture.

²² Diskiene, D., Pauliene, R.: Leader-Follower Relationship Behaviors: Who is a Gatekeeper to Leadership Outcomes? Mediterranean Journal of Social Sciences, MCSER Publishing, Rome Italy, 5 (9), 2014, p. 154

²³ Diskiene, D., Pauliene, R.: Leader-Follower Relationship Behaviors: Who is a Gatekeeper to Leadership Otucomes? Mediterranean Journal of Social Sciences, MCSER Publishing, Rome Italy, 5 (9), 2014, p.155

²⁴ Goleman, D.: Leadership that gets results. Harvard Business Review, 2000, p. 78-90

²⁵ Denning, S.: How do you change an organizational culture? Source: <https://qs-gen.com/how-do-you-change-an-organizational-culture-2/>, accessed 10. July 2020

Denning noticed that a successful strategy for the agile transformation begins by “leadership tools, including a vision or stories of the future, which cement the change in place with management tools, such as role definitions, measurement and control systems, and use the pure power tools of coercion and punishments as a last resort”²⁶.

In traditional companies the autocratic leadership style is still existing but not in the original form. Due to the existing hierarchical levels and the reporting from the bottom to the top, this leadership style will still exist. Especially in large companies because of a functional organization it is difficult to establish another or alternative type of a leadership. On one side the leader should follow the hierarchical structure of the organization, bring results and on other side follow the changes, be flexible and give the team the responsibility. In this case a contradiction arises.

It is important to give employees a certain amount of freedom and to promote self-organization. It is not always a smooth process to switch to self-organization, where groups take ownership of their own decisions. Employees also need to be open to the type of change and see self-organization as an advantage. Working according to instructions seems to be a better alternative because not every employee is ready for the type of change.

The following illustration shows the rough structure of leadership influence and dependencies on the organizational performance.

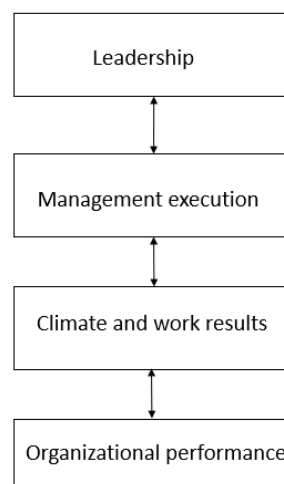


Figure 1: Leadership influence and dependencies on the organizational performance

Source: Author`s illustration

²⁶ Denning, S.: How do you change an organizational culture? Source: <https://qs-gen.com/how-do-you-change-an-organizational-culture-2/>, accessed 10. July 2020

The above illustration shows that the levels are interrelated. The organizational performance depends very much on the results, which in turn are shaped and carried out by the leader.

An important element in agile transformation is that the leadership teams need to be introduced under circumstances that promote mutual understanding and allow every team member to “cultivate leadership skills in three phases: a) discovery and agitation, b) proliferation and dissemination, and c) integration and institutionalization”²⁷.

The employees view transformation process either positively or negatively. It depends on how leadership interaction works. If the employees understand what exactly happens in the change process and the complex change process brings an advantage to people and the organization, then there is also the belief that the change process is necessary²⁸. In case of ignorance or not involving the employees there will be more resistance to the change process and organizational identity will be disrupted.

The following outline shows the interdependency of the agility with leaders, culture and communication, employees and goals and visions of the company.

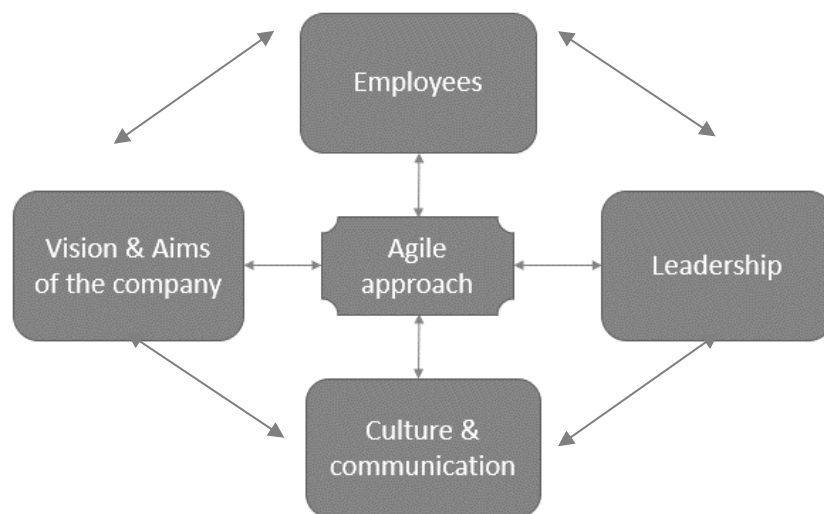


Figure 2: Interaction of the influencing corporate elements to create agility

Source: Author's illustration

The illustration above shows how the agility interact with the following factors: employees,

²⁷ Parker, D. W., Holesgrove, M., Pathak, R.: Improving productivity with self-organized agile leadership. *International Journal of Productivity and Performance Management*, 61 (2), 2015, pp. 112-128

²⁸ Caulfield, J. L., Senger, A.: Perception is reality: change leadership and work engagement. *Leadership and Organization Development Journal*, 38 (7), 2017, pp. 8-11

leaders, vision and aims and culture. The elements are also dependent on each other and represent a kind of interaction.

It is a long and ongoing process until an agile way of thinking and working is reflected in management behaviour and adapted by subordinate employees. The results show that a stable framework inside the organization is crucial for this²⁹.

It should also not be forgotten that the planning of the change is an important point. For this there should be an analysis that state and internal assessment regarding readiness for organizational change³⁰.

Caulfield and Senger emphasized free-flowing bidirectional communication across the organization and departments to give voice to everyone involved impacted by the change³¹.

Paradoxically, this leads to the fact that the basic rules and meaningful elements are ultimately subject to a negotiation process. That is, they themselves are to be regarded as contingent, but not to the extent that, for example, business strategic decisions are. The conscious acceptance, even the targeted use of paradoxes in leadership behaviour is generally seen as promoting agility³².

Agile transformation has visible and invisible processes that are in change. With agile adoption the change and the transformation of organizational culture may be the most invisible and difficult. Planning is also key for team changes and employee development.

Accordingly, the basic elements of agile leadership are characterized on the one hand by a high degree of content-based and action-guiding basic rules - for all hierarchical and heterarchical organizational units. On the other hand, agile company management is based on independent, self-responsible action and collaboration among network members.

In a common transformation process, there are many ambiguities for the leadership especially at the beginning when no fundamental, systematic decisions or changes are in place

²⁹ Redmann, B.: *Agiles Arbeiten im Unternehmen. Rechtliche Rahmenbedingungen und gesetzliche Anforderungen*. Freiburg: Haufe, 2017, pp. 34-38

³⁰ Weiner, B. J., Amick, H., Less, S. Y.: *Conceptualization and measurement of organizational readiness for change: A review of the literature in health services research and other fields*. *Medical Care Research Review*, 65 (4), 2008, pp. 379-436

³¹ Caulfield, J. L., Senger, A.: *Perception is reality: change leadership and work engagement*. *Leadership and Organization Development Journal*, 38 (7), 2017, pp. 1-40

³² Lewis, M. W., Andriopoulos, C., Smith, W. K.: *Paradoxical leadership to enable strategic agility*. *California Management Review*, 56 (3), 2014, p. 63-64

and implementation are not yet mature. Leaders question how leadership should look like under these circumstances and try to transfer the changes into their praxis. Uncertainties and identity difficulties often arise.

It is very important to consider the culture of the company, to illuminate all areas, to understand how it works. It makes sense even before the agile method is introduced. This means that it is indispensable to inspect whether core organizational behaviours and beliefs are aligned with agile culture, values, and principles³³. Since the agile approach focuses more on people, it is essential to look at the culture. It is precisely this intention that can steer a leader in the right direction and establish the necessary conditions.

The organizational culture consists of the interactions and the collaboration and togetherness. Traditions and rituals play a role here. There are certain standards that people follow. Leaders of a conventional company are at the centre of the needed shift in mindset to enable a prosperous agile transformation.

1.1.2 Theoretical analysis of leadership type in companies' culture

The modern global working world is determined by a complex and volatile market environment. Companies are part of an operational environment, which is marked by constant changes³⁴.

In terms of leadership, the agile approach cannot be considered as a management type or tool that will be introduced and completed, as agile approach starts not only with the actions of the employees, but with their way of thinking and attitude to what leaders have enormous influence on.

This particularly means that the basis of agile work approach is a change in values that takes place in the mindset. An agile behaviour and agile work practice is formed by agile thinking as actions and non-actions of employees are influenced by their attitudes. For this reason,

³³ Forcellini, F. A., Gomes, F., Tolfo, C., Wazlawick, R. S.: Agile methods and organizational culture: reflections about cultural levels. *Software Maintenance and Evolution: Research and Practice*, 23 (6), 2011, p. 423-441

³⁴ Colin, C.-T.: Leadership. Culture and Entrepreneurship: *Effective Executive* 18 (2), in https://www.academia.edu/12892257/Leadership_Culture_and_Entrepreneurship, accessed 13. July 2020

the mindset of the management and employees is very much in focus. The basis of employee's work, decision making, motivation and self-development is a strong identification with the company's philosophy. Therefore, leadership cannot be considered separately from corporate culture. Corporate culture values in turn form the basis for managerial leadership understanding.

Organizational culture plays an enormous role in the success of a company. The ability to adapt to rapid change depends crucially on the culture that is lived. An organizational culture is based on a system of shared values, social norms and attitudes that influence how participants within an organisation make decisions, how they act and how they behave. The certain leadership type shapes the organizational culture in companies.

It is also crucial how leadership is exemplified, how decisions are made or even how relationships in the team or with customers and partners are shaped. The development of organizational culture therefore includes not only leaders but also all employees of an organisation. Even if the buzzword organizational culture has established itself very quickly, there is still no consensus on what exactly is to be understood by culture³⁵.

According to Lang culture is a polysemous term as it is based on the learnings and creations and is therefore strongly connected to designing. When individual cultures are being considered, then behavioural attitudes, mindsets and material creations are meant, in which certain human communities correspond. The congruence degree of cultural definitions always remains open³⁶.

According to Hatch every social unit that has had some kind of shared history goes through a corresponding learning process and develops a culture. The strength of this culture depends on the duration, the stability of the members of the group and the emotional intensity of the learning experience³⁷.

³⁵ Lässig, A.: Gestaltung der Organisationskultur, Evaluation kultureller Veränderungsprozesse in Wirtschaftspsychologie Band 9, Europäischer Verlag der Wissenschaften, Peter Lang GmbH Frankfurt am Main 2002, p. 13

³⁶ Lang, H.: Kultur und Evolutionstheorie, Zeitschrift für Ethnologie, 1999, p. 5-12

³⁷ Hatch, J. M.: The Dynamics of organizational culture, Academy of Management. The Academy of Management Review; 18 (4), 1993, pp. 657-693

Hofstede defined as a result “organizational culture” as follows: “The collective programming of the mind that distinguishes the members of one organization from another”. However, the culture of an organization is maintained not only in the mind of its members but also in that of its other “partners”; this means those who are involved in the organization, such as customers, suppliers, workers, organizations, neighbours, authorities, and the press³⁸.

Through their long-term engagement and progressive knowledge increase, the employees are a knowledge management instrument. Culture influences the attention focus of its members, their behaviour and engagement and can, therefore, be considered a control system. The norms and rules depend on a given culture, generating a particular behaviour in consequence³⁹.

For this reason, in order to ensure the continued existence of the company, it is crucial not to view organizational culture as a single element, but also to see the interaction between several factors in which employees are in the middle. Each company shape their own corporate culture. Because it is not enough to deal with the culture concept as it hides a by far more complex constellation, which requires further explanation⁴⁰.

According to Schein one of the greatest dangers in cultural change programs is the assumption that strategy and external adaptation issues should be considered separately from the culture and focus only on those desired cultural changes of internal mechanisms with which the group feels comfortable⁴¹.

For this reason, the strategy tends to be considered as not crucial or too general and can be ignored. Ideally, the existing culture is reflected in the strategy and offers an opportunity for improvement/optimization. This is because the strategy is measurable and can also be recorded in further detail using KPIs.

³⁸ Jones, M. L.: Hofstede – Culturally questionable? In Oxford Business and Economics Conference Oxford, UK, 2007, p. 2-6

³⁹ Mills, J. C., Mills, A. J.: Rules, Sensemaking, Formative Contexts, and Discourse in the Gendering of Organizational Culture. In Ashkanasy N. M., Wilderom C. P., Peterson, M. F. (Eds.): Organizational Culture and Climate Thousand Oaks, Sage Publications, Inc. 2000, pp. 55-70

⁴⁰ Colin, C. T.: Leadership for Innovation and Business Excellence, Management Services, 63 (1), 2019, pp. 29-33

⁴¹ Hatch, J. M.: The Dynamics of organizational culture, Academy of Management. The Academy of Management Review; 18 (4), 1993, pp. 661

Hofstede rightly notes that while culture is a “soft feature”, its changes require “hard” measures to change structure and processes⁴².

According to Hofstede general rule is that people adapt to the culture of their new environment when they are moved one by one; if people are transferred as groups, they take their group culture with them. As part of their culture, people in groups have developed forms of interaction that are very stable and difficult to change. A change would mean that all interpersonal relationships have to be renegotiated and thus the undesired old structures can possibly be eliminated⁴³. Thus, Hofstede shows that culture is very profound and cannot be changed immediately or easily.

But because of their personalities, their life experience, or the subculture in which their careers have developed, they have assumptions that differ to different degrees. The universal desire for a “strong” culture from an organizational point of view has often been questioned. Attitudes towards strong organizational cultures are partly influenced by elements of national culture⁴⁴.

Organizations with strong cultures face much greater difficulties if they are to be changed for strategic reasons. Because the members believe in these values and align their behaviour accordingly, regardless of whether the activities are harmful to the survival of the company or not. But before overarching changes can be made, the company must first analyze their existing culture and be clear in which direction the company should move, to be clear what is existential and important for the company and how they want to realize it.

Culture is made up of visible and invisible components. Cultural groups can be distinguished from each other depending on their characteristics. The visible components include ethnic origin, age or gender. To the invisible components belong nationality, the value system, views, competences, thought processes, activities, belief, and religion⁴⁵.

⁴² Jones, M. L.: Hofstede – Culturally questionable? Oxford Business & Economics Conference Oxford, UK, 2007, pp. 2-6

⁴³ Jones, M. L.: Hofstede – Culturally questionable? Oxford Business & Economics Conference Oxford, UK, 2007, pp. 2-6

⁴⁴ Hatch, J. M.: The Dynamics of organizational culture, *Academy of Management. The Academy of Management Review*; 18 (4), 1993, pp. 657-693

⁴⁵ Criveanu, M. M., Silviu-Valentin, C.: Analysing the relationship between the visible and invisible components that create organizational culture, *Annals of the “Constantin Brâncuși” University of Târgu Jiu, Economy Series*, 17 (6), 2017, p. 157

To illustrate exactly this, the author leans on the onion model from Hofstede.

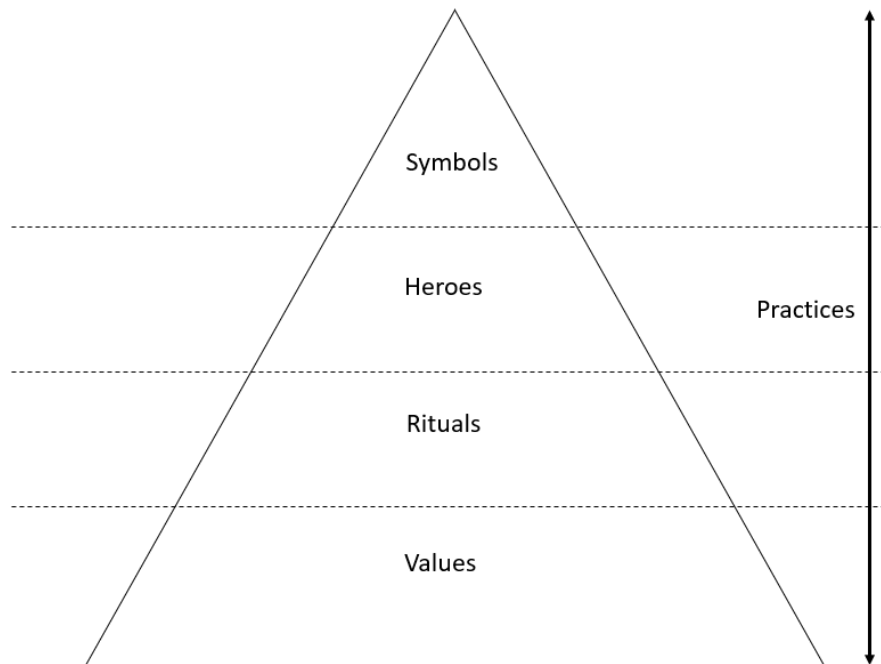


Figure 3: Structure model of the terms in the context of culture definition based on Hofstede⁴⁶

Values and norms form the core of the model are invisible. They are conveyed very early in life by parents and the environment and influence the way people think and act. They form the core of the culture and are expressed in tendencies to prefer certain conditions to others. Every manifestation in the form of behaviour, language, etiquette, architecture, organizations etc. can be traced back to this core⁴⁷.

This means that each person in the company has his own values, mindset, and ideas but with attributes such as language that unite employees in companies.

The next dimension is rituals. These are activities or processes that are important within a cultural group. This includes behaviour such as shaking hands in greeting or religious celebrations⁴⁸.

⁴⁶ Hofstede, G. H.: Identifying Organizational Subcultures: An Empirical Approach. Journal of Management Studies, 35 (1), 1998, p. 1–12

⁴⁷ Mole, J.: Mind Your Manners: Managing Business Culture in a Global Europe. 3. Aufl., Nicholas Brealey Publishing, London 2008

⁴⁸ Hofstede, G. H.: Identifying Organizational Subcultures: An Empirical Approach. Journal of Management Studies 35 (1), 1998) pp. 1–12

The other layer are symbols. These can consist of words, images, objects, but also gestures. A particular dimension is the practice that encompass and emerge from symbols, heroes, and rituals. Although they are observable and visible to outsiders, they can only be correctly interpreted by people from the same culture^{49,50}.

In summary, it can be argued that it is upbringing, the values conveyed in childhood that make people unique and thus different, but rituals and symbols unite a company and thus offer a means of understanding and communication. This kind of understanding and communication through the same understanding of rituals and symbols creates the common culture.

Considering manufacturing companies and the theory based on Hofstede's model, the following model was developed by the author:

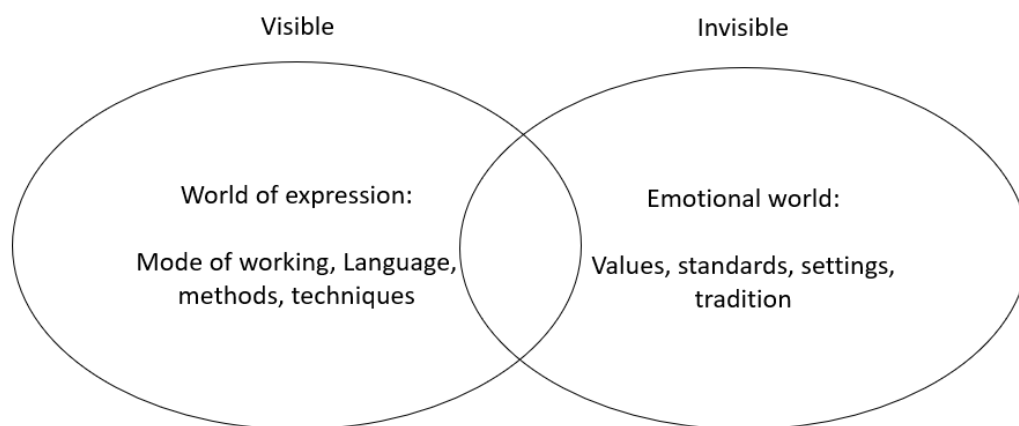


Figure 4: Cultural attributes of the organization divided in visible and invisible

Source: Author's illustration based on Hofstede

The organizational culture consists of the visible and invisible areas. In the visible area there are the complete expression in the form of language and the invisible area anchors the internal values and norms of the people, which in turn influence the world of expression.

⁴⁹ Hofstede, G. H.: Culture and Organizations: Software of the mind. 3. Aufl., McGraw-Hill Professional Publication, New York 2010

⁵⁰ Hofstede, G. et al.: Measuring Organizational Cultures: A Qualitative and Quantitative Study Across Twenty Cases. Administrative Science Quarterly 35 (2),1990, p. 291

Usually, organizations create a corporate culture that shapes the behaviour and hierarchies of each employee. Organizational culture is “one of the most powerful and stable forces operating in organizations”⁵¹.

The structure of corporate culture that develops and exists is mostly shaped by the leaders and, thus, management has a major impact on corporate culture. Corporate culture means collaboration, however with various characteristics. Its characteristics vary. Leader has a major influence on the direction in which the culture of the company develops because a leader can give a company a direction.

An organization is usually a meaningful unit. As part of the organization the communication relationships can be simplified and standardized, so an organization can act faster⁵². The structure of the communication involves transferring responsibility to the next higher place.

Usually the responsibility is given up, so the decisions are made. Thus, organizations are controlled hierarchically. The organization with its structures becomes more and more complex. The task is complex and not transparent due to this complexity. To get this overview leaders are increasingly engaged in meetings to coordinate and monitor operations. This stability provides a framework for standardized results⁵³ or even opportunity to hide behind this organisational dilemma.

Most authors see the shared element of company values and norms as a central element of corporate cultures. This system of values and standards influences perceptions, thoughts, feelings, and actions. It determines the experience and behaviour of employees in relation to various aspects of organizational reality. Values and norms are recognizable in employee statements⁵⁴.

In order to change an existing corporate culture, it has to be replaced by a new one. That means: Hundreds, if not thousands, of people have to adapt their personal values⁵⁵. Precisely because culture is something very diffuse and subconscious, you cannot make this change

⁵¹ Schein, E. H.: Culture: The missing concept in organization studies. *Administrative Science Quarterly*, 41 (2), 1996, p. 231

⁵² Colin, C. T.: Leadership, Culture and Entrepreneurship, in *Effective Executive*, 18 (2), 2015, p. 23

⁵³ Gloger, B.: *Scrum Think Big Scrum für wirklich große Projekte, viele Teams und viele Kulturen*. Carl Hanser Verlag München, 2017

⁵⁴ Glisson, C.: Assessing and changing organizational culture and climate for effective services. *Research on Social Work Practice*, 17 (6), 2007, pp.736-747

⁵⁵ Colin, C. T.: Leadership, Culture and Entrepreneurship, in *Effective Executive*, 18 (2), 2015, p. 22

in a few words. Corporate culture is something very difficult to grasp. It takes place on different levels⁵⁶.

An organizational culture, in which creative employees are supported and promoted and can, thus, bring in their potential to bear, is an important goal for a successful company. The correlation between organizational culture and corporate success has already been impressively proven in a number of empirical studies. Leadership is based on culture, that means that culture is the main component of leadership⁵⁷.

In summary the words organizational culture is a broad term and seems to be like an "umbrella" that contains other terms such as behavior, communication, values and norms, which then lead to a uniform cross-company strategy. The leaders have to disseminate this strategy throughout the company, coordinate it with employees and implement it together. At the end, the company culture influences the success of the company. From the point of view of the author of this thesis culture represents a dependency with the term's values, norms, and behavior. On the practical side it reflects to be company strategy, realization of the strategy and KPIs.

Exactly this dependency is formed, conceived, and supervised by leaders and for this reason the leader gains a central position in the organizational culture, who sets the direction and carries and conveys the values and norms.

1.2 Theoretical analysis of agile work practice in companies

In this subchapter the author explains the definition of agile work practice what includes the methodological and agile project management approach what is used for achieving the goals in companies. Also, the author gives a definition and discuss the difference between the agile and classic way of working. In the context of agile transformation, it is crucial to pay special attention to agility in a framework of agile work practice, to define it and to implement it in the company. Agile work practice represents a central element in the agile transformation.

⁵⁶ Hatch, J. M.: The Dynamics of organizational culture. The Academy of Management Review; Oct 1993
Edgar Schein's Organizational Culture and Leadership, as seen through the lens of Ken Wilber's AQAL Framework, Cotter-Lockard Dorianne, Fielding Graduate University, 2009

⁵⁷ Block, L.: The Leadership-Culture Connection: An Exploratory Investigation, Leadership and Organization Development Journal, 24 (6), 2003, pp. 318-334

Agile work practice can be scaled by agile project management and agile methods. Agile work practice can be lived and implemented in a project form in a best way because projects are issue-based. In a project not all employees have to be involved. So, for this reason it is possible to work on several projects at the same time and to address different interests and achieve different goals.

According to projects the employees can be involved according to their strengths and professional direction. Many tasks today are complex and novel and often the cooperation of different experts is necessary for successful work. In projects, experts from several departments form a team in which they work together on a project. This work in cross-departmental project teams enables greater flexibility and faster decision-making.

Before starting the theoretical analysis of agile work practice it is important to define the term agility. The agility model developed since the 1990s and is a collection of elements of various organizational theory approaches and contains a large number of organizational concepts that have been continuously expanded and changed.

It is important to mention that companies during the agile transformation should not start by implementing of agile methods and not to copy the agile best practices of other companies. At the first step it is important to analyze the current state after an analysis procedure and then define the agile way of realization and the agile framework in the next step. The method should first and foremost serve as an instrument for the realization of the project.

1.2.1 Agile work practice in companies

According to Highsmith the term "agile" is intended to express that the management and steering of projects and processes must be dynamic and flexible and that it must also be possible to implement requirements and react to changes in turbulent and rapidly changing market conditions⁵⁸.

Agility became popular in the early 1990s through publications on production strategies and continues to be popular in the 21st century⁵⁹. The popularity of agility in the decade increased

⁵⁸ Highsmith, J. A.: Agile project management; creating innovative products; 1. Auflage; Addison-Wesley Longman; Amsterdam, 2004, p. 16

⁵⁹ Förster, K., Wendler, R.: Theorien und Konzepte zu Agilität in Organisationen. Dresdner Beiträge zur Wirtschaftsinformatik, 63 (12), 2012

primarily due to its use in IT (information technology)⁶⁰. What has been new since the beginning of the 2000s is the bundling of different methods within frameworks⁶¹.

Agility requires a high level of communication in a network of employees. Referring to Appelo agility stands for a high degree of networking and flexibility and trust based on the communication and networking⁶².

Short, iterative development cycles should create added value for customers. The implementation is self-organized, which is also described as the core of agility⁶³. Agile work practice requires a constant speed of work and the proactive integration of the customer into the development process in order to react quickly to changing framework conditions⁶⁴.

Teams work synchronously on a common goal and achieve its sub-goals through incremental product deliveries. Agile work practice requires a high degree of team discipline which is driven indirectly by team members⁶⁵.

Agile work practice is also described as “radical employee orientation”⁶⁶. Some elements (customer loyalty) are not a new phenomenon, but rather an evolution of best practices that have been continually adapted and improved⁶⁷. The previous focus on automation and standardization increases the effectiveness of an organization but prevents innovations that are on the leadership execution and employee collaboration level⁶⁸.

The paradox in the classic way of thinking is the natural, inherent uncertainty in processes, which cannot be compensated by even more advance planning. Robust planning necessary

⁶⁰ Mergel, I.: Agile Innovation management in government: A research agenda. *Government Information Quarterly*, 33 (3), 2016, p. 518

⁶¹ Williams, L., Cockburn, A.: Agile Software Development: It’s about Feedback and Change. *Computer*, 36 (6), 2003, p. 40

⁶² Williams, L., Cockburn, A.: Agile Software Development: It’s about Feedback and Change. *Computer*, 36 (6), 2003, pp. 39-43

⁶³ Förster, K., Wendler, R.: Theorien und Konzepte zu Agilität in Organisationen. *Dresdner Beiträge zur Wirtschaftsinformatik*, 63 (12), 2012, p. 20

⁶⁴ Dingsøyr, T., Lassenius, C.: Emerging themes in agile software development: Introduction to the special section on continuous value delivery. *Information and Software Technology*, 2012, p. 1214

⁶⁵ Siakas, K. V., Siakas, R.: The Agile Professional Culture: A Source of Agile Quality. *Software Process Improvement and Practice*, 12, 2012, p. 607

⁶⁶ Häusling, A., Rutz, B., Oimann, K., Oebbeke, B.: Agil anpassen! *Personalmagazin*, 11, 2014, p. 18

⁶⁷ Miller, G. G.: The Characteristics of Agile Software Processes, *TOOLS '01 Proceedings of the 39th International Conference and Exhibition on Technology of Object-Oriented Languages and Systems*, Washington, DC., 2001, pp. 385-387

⁶⁸ Stoffel, M: Leadership 4.0 – Unternehmen brauchen ein neues “Betriebssystem”. In von C. Au (Ed.), *Wirksame und nachhaltige Führungsansätze*, Wiesbaden: Springer 2006, pp. 205-222

for this is only possible if all knowledge is available in advance. However, this does not correspond to reality.

It is clear to note that the definition is not yet clear, and which framework for agile work practice match to the description of agile companies⁶⁹.

Methodology is a generic term for a specific, definable collection of methods, rules and guidelines. A method, on the other hand, is more specific and defines a sequence of activities. Furthermore, a method is usually clearly assigned to a methodology. Furthermore, there are processes as a sequence of activities, which in turn are consolidated in the fourth level.

Wiedmann describes the following levels:

- Agile practices that include defined procedures.
- Agile principles that can be interpreted as maxims for action.
- Agile values that are documented in the agile manifesto.
- Offer scope for interpretation but describe general priorities in their tendency.
- Agile characteristics that describe generalities such as flexibility⁷⁰.

The foundation is therefore the four agile values and 12 agile principles of the agile manifesto. Agile Manifesto was written by 17 software developers. In addition, there are agile methods that primarily come from software development, but are increasingly being used as a management method, such as scrum⁷¹.

Rigby, Sutherland and Takeuchi state, almost 20 years after the agile manifesto, that agility has brought about a revolutionary change in software development⁷².

The continuous expansion within IT (information technology) as well as in other industrial sectors demonstrates the interest in shortened reaction times. This requires the adaptation of agile methods to the new requirements. This is increasingly leading to a growing acceptance

⁶⁹ Förster, K., Wendler, R.: Theorien und Konzepte zu Agilität in Organisationen. Dresdner Beiträge zur Wirtschaftsinformatik, 2012, p. 7

⁷⁰ Wiedmann, P. C. K.: Agiles Geschäftsprozessmanagement auf Basis gebrauchssprachlicher Modellierung. (Doctoral dissertation). Available from EconBiz, 2016, pp. 87-88

⁷¹ Häusling, A., Wiegand, S.: Agil dank Scrum. Personalmagazin, 6, 2012, pp. 18-20

⁷² Rigby, D. K., Sutherland, J., Takeuchi, H.: Embracing Agile. Harvard Business Review, 44 (5), 2016, pp. 40-48

of agility as a management concept⁷³.

From the application level agile principles are transferred for example to the development and production of physical parts in automotive engineering⁷⁴. Besides product development, agile processes can also be implemented in sales, marketing, strategic planning, and logistics. Less obvious is the use of agile processes in plant maintenance, sales and controlling⁷⁵.

It becomes clear that agile methods have arrived in the production of physical products. According to Brandes and Heller agile methods are also expanding to portfolio management and operations⁷⁶.

Agile transformation starts by implementing agile values, which is closely connected and leads to agile methods like Scrum. But to work effectively in agile content it is needed to internalize the agile values and principles.

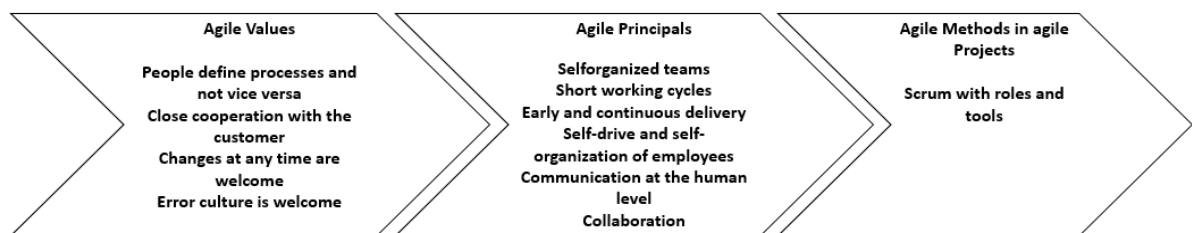


Figure 5: Agile scaling based on the existing characteristics in companies

Authors illustration based on literature review

In summary it can be said that agile work practice originates from the digital world and is understood as a cross-industry solution approach for a VUCA⁷⁷ environment. By transferring it to other application areas, agility has established itself as a management concept with a

⁷³ Tayloer, K.: Adopting Agile Software development: the project manager experience. Information Technology and People, 29 (4), 2016, pp. 670-687

⁷⁴ Erretkamps, H., Oswald, A.: Der agile Produktentstehungsprozess – mehr als ein Prozess. R. Wagner, Grau, N. (Eds.), Basiswissen Projektmanagement – Prozesse und Vorgehensmodelle, Düsseldorf: Sypmposion, 2014, pp. 1-31

⁷⁵ Rigby, D. K., Sutherland, J., Takeuchi, H.: Embracing Agile [Supplemental material]. Harvard Business Review, 44 (5), 2016

⁷⁶ Brandes, C., Heller, M.: Qualitätsmanagement in agilen IT-Projekten – quo vadis? essentials, Wiesbaden: Springer, 2016, p. 128

⁷⁷ VUCA: V-volatility, U-uncertainty, C-complexity, A-ambiguity

basic strategic understanding⁷⁸.

Agile companies operate with an inner state that is both stable and flexible. Stability is created by frameworks for agile leadership, organization, goal setting and work. These enable the systematic, flexible handling of dynamic external requirements. Maximum adaptability with optimal stability is the declared maximum goal of agile enterprises.

Agile work practice is not an end in itself - rather, it is about interacting more flexibly and at shorter intervals with the complex company environment. This interaction ultimately leads to better services and products for customers, and thus to market-changing offers. Rather, agile work practice should increase the adaptability of the company and increase internal effectiveness and efficiency. Ideally, this is achieved by working in an agile manner and according to agile methods at all levels of the company (innovation, strategy, management, product and project implementation and at task level).

1.2.2 Agile methodological approach

People are an important driver of dynamic company environment and thus also a driver of agile work practice. A distinction is made between roles inside and outside the company. Agile methods have an effect on customers outside, on employees inside the company.

In the medium to long term, the company can tap into positive effects for the entire company. In the short term, the introduction of agile values, principles and methods can initially lead to uncertainty and frustration. However, this subsides with the first feelings of success.

Agile methods are concrete procedures in the course of project implementation and product development that are based on values and principles.

Agile methods are increasingly based on internal teamwork, that is why they are most effective in small and manageable organizations. This transparency that is in small organizations is not directly available in large organizations⁷⁹.

⁷⁸ Buchholz, U., Knorre, S.: *Interne Unternehmenskommunikation in resilienten Organisationen*. Springer Heidelberg, 2017, pp. 41-51

⁷⁹ Banerjee, P., Friedrich, R., Bash, C., Goldsack, P., Huberman, B., Manley, J., Patel, C., Ranganathan, P., Veitch, A.: *Everything as a service: powering the new information economy*. *Computer* 44 (3), 2011, pp. 36-43

Another challenge is that large enterprises are represented worldwide and are accordingly heterogeneous, so here is the need to apply agile methods in distributed enterprises.

Nevertheless, the agile methods are based on external collaboration and communication⁸⁰. Especially by distance in the company's work over the plants. Agile methods help by challenges caused by distance in global work. Suitable agile methods of working may bring each other closer by improving collaboration and communication⁸¹.

One method is highlighted that has proven to be the most common and successful method over time⁸². Scrum and agile work practice are more than a way to make projects successful. Scrum follows certain principles and rules to effectively organize work processes⁸³.

Scrum is first and foremost a particular way of thinking and based on values of togetherness and thus on a human image which for many organizations means no less than a complete cultural change⁸⁴.

Usually, scrum is first used on team or project level as a project management method⁸⁵. Some companies leave it at this level, others use scrum to manage their entire organization over time.

Scrum emerged from complex product development⁸⁶. The approach was born out of necessity, because at the beginning of the project the customer is not always sure which product he wants, and it is difficult to predict which technological challenges will be encountered.

Scrum is a framework for the management of complex projects. Complex projects are characterized by the fact that it is not possible to predict exactly how the project will develop and what will happen in the future.

⁸⁰ Hanssen, G., Smite, D., Moe, N.: Signs of agile trends in global software engineering research: a tertiary study. In: Global Software Engineering Workshop (ICGSEW), Sixth IEEE International Conference on, 2011, pp. 17-23

⁸¹ Holmstrom, H., Fitzgerald, B., Agerfalk, P. J.: Agile practices reduce distance in Global Software Development. *Information Systems Management, Conchuir EO*, 23 (3), 2006, pp. 7-18

⁸² Budacu, E., Pocatilu, P.: Real Time Agile Metrics for Measuring Team Performance *Informatica Economica*, 22 (4), 2018, pp. 71

⁸³ Paasivaara, M., Behm, B., Lassenius, C., Hallikainen, M.: Large-scale agile transformation at Ericsson: a case study. *Empirica*, 2018, 23. pp. 2550–2596

⁸⁴ Karabulut, A. T., Ergun, E.: A new way of Management: A Scrum Management, 4 (2), 2018, p. 108

⁸⁵ Weber, J., Förster, D., Stäbler, M., Paetzold, K.: Adapt!-Agile Project Management Supported by Axiomatic Design. *MATEC Web of Conferences* 127, 01018, ICAD 2017, p. 2

⁸⁶ Budacu, E., Pocatilu, P.: Real Time Agile Metrics for Measuring Team Performance *Informatica Economica*, 22 (4), 2018, pp. 71-77

Schwaber described a scrum as not predictable⁸⁷. The term first appeared in 1986 and was described by Takeuchi and Nonaka as a method for product development. Almost 10 years later Schwaber and Sutherland took up the topic and developed scrum together as a method for managing agile software projects⁸⁸.

In the following illustration the author shows the graphical overview of the method scrum. The roles and elements of this method would be described also in tables under the illustration. It is important to provide the main picture.

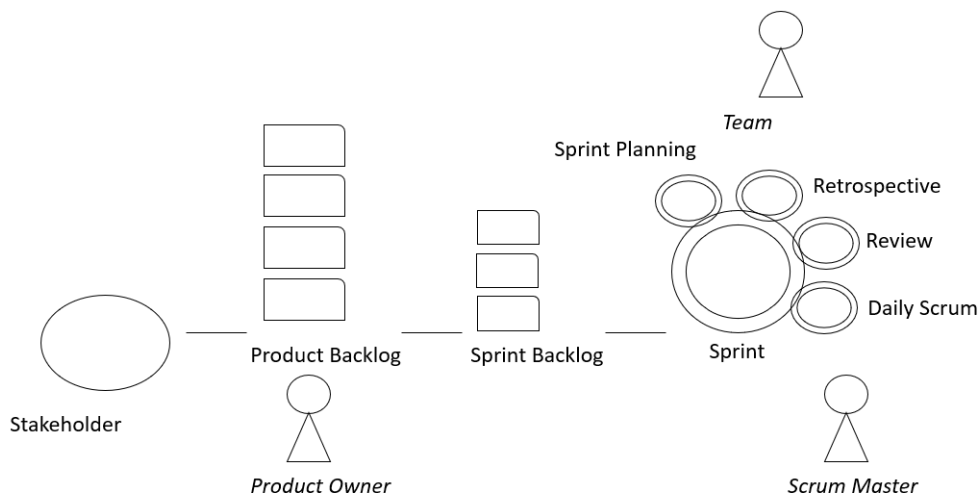


Figure 6: Structure and set-up of roles and scrum elements in the project realization based on Schwaber & Sutherland

The framework consists of scrum teams and the roles, artifacts and meetings associated with them. Each of these elements describes a special aim and is essential for the application of scrum and its success.

All steering responsibilities in a project are in these three roles: the team, the product owner, and the scrum master. In the following table are shortly described the responsibilities of the different roles:

⁸⁷ Karabulut, A. T., Ergun, E.: A new way of Management: A Scrum Management, 4 (2), 2018, p. 109

⁸⁸ Wirdemann, R.: Scrum mit User Stories; 1. Auflage, Carl Hanser Verlag München Wien, 2009

Table 1: Description of Scrum Roles and their responsibilities

Product Owner	<ul style="list-style-type: none"> responsible for increasing the business value of the resulting product defines the goals of the development, the properties to be implemented and their priorities represents the requirements of the users, customers, and management bears the economic responsibility for the respective project⁸⁹
Scrum Master	<ul style="list-style-type: none"> is a management role supports and optimizes the scrum process to achieve the best outcomes a coach, who supports his team and removes obstacles⁹⁰ leadership focuses on convincing and inspiring the team
Team	<ul style="list-style-type: none"> self-organized decisions are always made together the team is responsible for the product autonomy empowerment⁹¹ cross-functional knowledge

Source: Author's creation based on literature research

Scrum is suitable not only for complex product development but also for complex team building⁹². Scrum can only be effective if there is transparency, and the procedure is clear and straightforward. Such elements as sprint, a product backlog, sprint backlog and user story provide the constant visibility that is a prerequisite for effective inspection.

Here is a short description of the scrum artefacts:

Table 2: Description of Scrum Artefacts and their description

Sprint	<ul style="list-style-type: none"> defined period series sprint cycle content design, iteration and productive steps in scrum meetings are scheduled and discussed every weekday the topics⁹³ work topics are selected and assigned to members of the team
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⁸⁹ Savione, M., Rocha, V. F. Bezeraa, C., Matias, K.: A Synchronous Agile Framework Proposal Combining Scrum and TDD in ICSEA: The Eleventh International Conference on Software Engineering Advances, 2006, pp. 337-341

⁹⁰ Budacu, E., Pocatilu, P.: Real Time Agile Metrics for Measuring Team Performance. Informatica Economica, 22 (4), 2018, pp.70-79

⁹¹ Perlak, J.: Characteristics of self-organizing teams in agile project management: A case study, acta universitatis Nicolai Copernici. ZARZĄDZANIE XL, 6 (1), 2019, pp. 20-23

⁹² Budacu, E., Pocatilu, P.: Real Time Agile Metrics for Measuring Team Performance. Informatica Economica, 22 (4), 2018, pp.70-79

⁹³ Yin, S., Lu, F., Yang, Y., Jing, R.: Organizational culture evolution: Aimprinting perspective. Journal of Organizational Change Management, 27 (6), pp. 973-994, 2014

Product Backlog	<ul style="list-style-type: none"> • a list of all user stories known in the project⁹⁴ • all functional requirements of the product⁹⁵ • incomplete and dynamic • the goal is not to capture all potential requirements of the product⁹⁶ • a snapshot of the currently known user stories • product owner has priorities of changes in the backlog⁹⁷ • product owner is responsible for it⁹⁸
Sprint Backlog	<ul style="list-style-type: none"> • a plan to realize the sprint goal and the set of products • backlog items for the sprint⁹⁹ • highlights the work topics what a sprint aim
User Story	<ul style="list-style-type: none"> • describes a requirement of a product from the user's point of view • contains a concrete and visible added value or business value for the customer¹⁰⁰

Source: Author`s creation based on literature research

Most software projects are incremental and iterative in order to keep the margin of control small and thus reduce the risks of mistakes and complexity¹⁰¹.

The sprint review at the end of each sprint presents the results of the sprint. The team shows with a demo that the product really works. The goal of this meeting is to present the progress made. This is an important moment for the product owner to get feedback from other stakeholders¹⁰².

⁹⁴ Karabulut, A. T., Ergun, E.: A new way of Management: A Scrum Management, 4 (2), 2018, pp. 112

⁹⁵ Savione, M., Rocha, V. F. Bezeraa, C., Matias, K.: A Synchronous Agile Framework Proposal Combining Scrum and TDD in ICSEA: The Eleventh International Conference on Software Engineering Advances, 2016, p. 337-341

⁹⁶ Maarif, M., Shahar, S., Satar, N., Yusof, M: The Challenges of Implementig Agile Scrum in Information Systems Project in Journal of Advanced Research in Dynamic and Control Systems, 2018, 10 (9), p. 2359

⁹⁷ Karabulut, A. T., Ergun, E.: A new way of Management: A Scrum Management, 4 (2), 2018, pp. 113

⁹⁸ Weber, J., Förster, D., Stäbler, M., Paetzold, K.: Adapt!-Agile Project Management Supported by Axiomatic Design. MATEC Web of Conferences 127, 01018, ICAD 2017, p. 2

⁹⁹ Weber, J., Förster, D., Stäbler, M., Paetzold, K.: Adapt!-Agile Project Management Supported by Axiomatic Design. MATEC Web of Conferences 127, 01018 (2017) ICAD 2017, p. 2

¹⁰⁰ Karabulut, A. T., Ergun, E.: A new way of Management: A Scrum Management, 4 (2), 2018, pp. 113

¹⁰¹ Iterative in this context means that a period of time within a development process repeats itself again and again in a similar way. Incremental in this context means that the business value or innovation is gradually increased and a big-bang release is avoided

¹⁰² Savione, M., Rocha, V. F. Bezeraa, C., Matias, K.: A Synchronous Agile Framework Proposal Combining Scrum and TDD in ICSEA 2016: The Eleventh International Conference on Software Engineering Advances, 2016, p. 337-341

In the sprint retrospective the scrum master reflects and analyses together with all members of the scrum team aspects of the past sprint like relationships, processes, tools and skills¹⁰³.

Scrum focuses on continuous improvement. This applies not only to the work results presented in the sprint review but also to the actual development process. In the retrospective the team looks back and considers how it went and what can be improved in the next sprint¹⁰⁴. The aim of a retrospective is to apply the concept of self-organized learning, to improve the cooperation and development of the self-organized team and to promote the application of continuous improvement¹⁰⁵.

Here, the entire development process is divided into many small iterations that can be executed not only serially but also in parallel in different teams. The iterative, incremental nature of Scrum results in changes within the entire organization¹⁰⁶.

The leadership role changes because of self-organized projects. The success of the agile approach is to a large extent based on the fact that processes are adhered to and roles with tasks, responsibilities and competencies are clearly defined.

In contrast to classic requirements management, where the requirements are formulated as precisely as possible, success lies in agile project management. Before the project begins, the biggest challenge is to describe requirements in detail. At the beginning of the project the customer does not always know exactly what the final product should be, so it is difficult for him to describe entire requirements.

Also, in case of changes, requirements have to be described new. Scrum, as one method is dynamic and is defined and written during the course of the project, a dynamic is also created in communication and project implementation.

In summary, scrum processes reduce unnecessary administrative work. There is no need for team leaders to assign tasks and there is no need to think about who needs in what time

¹⁰³ Maarif, M., Shahar, S., Satar, N., Yusof, M.: The Challenges of Implementing Agile Scrum in Information Systems Project in *Journal of Advanced Research in Dynamic and Control Systems*, 10 (9), 2018, pp. 2357-2363

¹⁰⁴ Spieß, E. von Rosenstiel, L.: *Organisationspsychologie, Basiswissen, Konzepte und Anwendungsfehler*; 1. Auflage; Oldenburg Wissenschaftsverlag GmbH; München, 2010, p.92

¹⁰⁵ Perlak, J.: Characteristics of self-organizing teams in agile project management: A case study, *acta universitatis Nicolai Copernici*, 2019, pp. 20-23

the right information. The scrum framework regulates such issues.

In addition, requirements have to be made in a very specific way. This ensures that plans are not constantly thrown out of order and so much value is destroyed. Instead, the transparency created by the scrum processes ensures that everyone knows what is currently being worked on - and that these are also exactly the right topics.

Processes and methods are only effective and successful if the chosen process model fits the initial situation and the mindset of the people involved harmonizes with the paradigms of the respective method. Scrum represents a different approach and is in contradiction to the classical approach. For this reason, it makes sense to compare the two approaches.

1.2.3 **Agile approach versus classical approach of the work practice in projects**

Agile companies are changing the way they work in collaboration at all levels and in all areas. This is not only about the methods in detail. Above all, an agile mindset is needed, an attitude that enables hierarchy-free work at eye level, self-organisation, and self-management.

Only the mindset brings the necessary freedom, allows a team to take responsibility and develop a passion for their topic that is otherwise rarely found.

Agile work is primarily characterised by collaborative forms of work that serve to identify innovation or development potential and to transfer it to a solution with the highest possible acceptance. Whether in agile work practice with scrum, in innovation management with agile organisation, it is always about agile teams that are made up of experts from different disciplines to solve the problems of a defined group of people in collaborative cooperation.

Under the globalization change companies have a pressure to stay competitive in the market. For this reason, companies have to reduce the uncertainty and work in a flexible project-based way for delivering products with high quality on time¹⁰⁷. This concept of project-based work practice in companies allow to increase the flexibility, leanness, reaction

¹⁰⁷ Raymond, L., Bergeron, F.: Project management information systems: An empirical study of their impact on project managers and project success. *International Journal of Project Management*, 26 (2), 2018, pp. 213–220

to and learning from change¹⁰⁸.

Work practice in project framework has the focus to follow the accomplishment of plans. The important and the main way is based on what is done on time and within budget. For this reason, tracing project plan is also the main task of project management¹⁰⁹.

Agile work approaches are becoming more common and popular in projects¹¹⁰, but it is not enterprise goal to reorganize the organizational structure. For this reason, there are existing hierarchical organizational structures und agile work practice structure side by side¹¹¹.

The continues improvement process is an important aspect. Because agile work practice in projects is a characteristic for a living system to meet constantly changing market conditions¹¹². The creation and permission of (free) spaces and the room for self-controlled working with reflection and learning loops are crucial¹¹³.

In agile project management, commitment to the team, the project object and the environment is a key success factor¹¹⁴. The success and connection generally correlate with the attitude and the job satisfaction of the team members with whom he is compared to the project, the team and the environment¹¹⁵. Agile project management is based on empirical process and is described as a never-ending learning process¹¹⁶. Sutherland describes traditional project management methods as noniterative, phased, and plan-driven¹¹⁷.

¹⁰⁸ Campanelli, A. S., Parreiras, F. S.: Agile methods tailoring – A systematic literature review. *Journal of Systems and Software*, 110, 2015, p. 86-100

¹⁰⁹ Budacu, E., Pocatilu, P.: Real Time Agile Metrics for Measuring Team Performance. *Informatica Economica*, 22 (4), 2018, pp.70-79

¹¹⁰ Perlak, J.: Characteristics of self-organizing teams in agile project management: A case study, *acta universitatis Nicolai Copernici*, 2019 p. 19-27

¹¹¹ Lenges, M., Kloppenborg, T., Forte, F.: Identifying Key Agile Behaviors That Enhance Traditional Project Management Methodology, *Journal of Strategic and Sustainability*, 13 (2), 2018, p. 23

¹¹² Onag, G.: Agile project management goes beyond software development. *Computerworld Hong Kong; Newton* 2017, p. 1- 3

¹¹³ Lenges, M., Kloppenborg, T., Forte, F.: Identifying Key Agile Behaviors That Enhance Traditional Project Management Methodology *Journal of Strategic and Sustainability*, 13 (2), 2018, p. 31

¹¹⁴ Nicholls, G., Lewis, N., Eschenbach, T.: Determining When Simplified Agile Project Management is Right for Small Teams, *Engineering Management Journal*, 27 (1), 2015, p. 3-10

¹¹⁵ El-Wakeel, F.: Further Demystification of agile Project Management, *Technology Work Book, Strategy Finance/August* 2019, p. 79

¹¹⁶ Measey, P.: *Agile Foundations: Principles, Practices and Frameworks*. (Radstad, Ed.). Swindon, SN2 1FA, UK: BCS Learning and Development Ltd., 2015

¹¹⁷ Sutherland, J., Ahmad, N.: *How a Traditional Project Manager Transforms to Scrum: PMBOK vs. Scrum*, (Salt Lake City). Source: <https://www.scruminc.com/wp-content/uploads/2014/05/PMBOK-vs.-Scrum-Agile2011.pdf> , accessed 22. September 2021

Joslin and Müller on the other hand assume that it is hierarchical in structure of the project management. For this reason, it is predictable for the employees and management¹¹⁸.

The waterfall method is phase-oriented, and each phase has its own scope, content, and budget. It follows a clearly defined time frame, budget, scope which represents three dimensions of the iron triangle. The advantage of the waterfall model is laying in simplicity and clear scheduling of phase.

Formal and informal networks come alongside the hierarchical organizational structure. The networks ensure faster decisions and flexible provision of resources, while the hierarchical structures ensure the necessary stability and implementation standards¹¹⁹.

Internal communication provides special communication platforms to promote quick coordination and decision-making within the framework of informal exchange relationship. When putting together members of a group, the form of collaboration is still important when developing agile teams. Coagulating members conduct their activities relatively independently. Agile work practice is based on self-organized and self-learning teams or individuals¹²⁰. This requires a good network from each team member in the medium term, in which they can acquire and validate their required knowledge and information. In addition to the current situation and cultural influences, the actions of a team member also depend on the values they have and are correlated with each other¹²¹.

In this kind of team's decisions are taken quickly and the work process has a high motivation. The reason for this is the given autonomy what is driver for continuous improvement¹²².

¹¹⁸ Joslin, R., Mueller, R.: Relationships between a project management methodology and project success in different project governance contexts. *International Journal of Project Management*, 33 (6), 2015, pp. 615-618

¹¹⁹ Knorre, S.: Interne Unternehmenskommunikation aus der Perspektive organisationaler Resilienz. In G. Bentele, M. Piwinger, G. Schönborn (Hrsg.), *Kommunikationsmanagement. Strategien, Wissen, Lösungen* (Loseblattsammlung, Lieferung 3.90). Neuwied: Luchterhand, 2012, pp. 7–8

¹²⁰ Stettina, C. J., Hörz, J.: Agile portfolio management: An empirical perspective on the practice in use. *International Journal of Project Management*, 33, 2015, pp. 140-152

¹²¹ Tessem, B.: Individual empowerment of agile and non-agile software developers in small teams. *Information and Software Technology*, 56, pp. 873–889. Source: https://www.academia.edu/19214600/Individual_empowerment_of_agile_and_non-agile_software_developers_in_small_teams, 2014, accessed 14. August 2020

¹²² McHugh, O., Conboy, K., Lang, M.: Using Agile Practices to Influence Motivation within IT Project Teams. *Scandinavian Journal of Information Systems*, 23, 2011, p.98-100

The agile approach offers a flexible and less predictable approach. More and more companies that have developed their products using traditional waterfall methods are switching to agile practices¹²³.

In order to allow to react to the change in goals within a project by the client, technological progress or a lack of resources, classic and planning-oriented project management often turned out to be too rigid and inflexible¹²⁴.

In practice, classic work practice models are used for projects that can be planned consistently and that are hardly variable over the course of the project¹²⁵.

In the classic project management, the goal, time, and costs are important and those influencing factors can be clearly defined right from the start of the project. In addition, there is an important role in the implementation according to the waterfall model of management policy since the individual teams receive little personal responsibility¹²⁶.

In agile project management the entire project is not planned right from the start, but rather worked in stages that are characterized by a high degree of communication, adaptability, and exchange.

The project team undertakes the planning of these stages together and at the end of each stage there should be a result and the stage completed should be assessed in retrospective. This should lead to an increase in quality, acceleration of development time, focus on a result and a constant improvement of the process¹²⁷.

Even agile projects can fail, but here are the reasons if project scope is unclear, the tasks are not clearly defined, so the necessary resources cannot be obtained¹²⁸.

The following illustration shows the different procedures for common classic and agile procedures.

¹²³ Scherber, S., Lang, M.: Agile Führung: Vom agilen Projekt zum agilen Unternehmen, Symposium Publishing, 2015, p. 31

¹²⁴ Onag, G.: Agile project management goes beyond software development. Computerworld Hong Kong; Newton 2017, p. 1- 3

¹²⁵ Perlak, J.: Characteristics of self-organizing teams in agile project management: A case study, *acta universitatis Nicolai Copernici*, 29 (1), 2019, pp. 21-23

¹²⁶ Lenges, M., Kloppenborg, T., Forte, F.: Identifying Key Agile Behaviors That Enhance Traditional Project Management Methodology *Journal of Strategic and Sustainability*, 13 (2), 2018, p. 31

¹²⁷ Rasnacis, A., Berzisa, S.: Adaption of Agile Project Management Methodology for Project Team, *Information Technology and Management Science*, 18 (1), 2015, pp. 122-128

¹²⁸ Nicholls, G., Lewis, N., Eschenbach, T.: Determining When Simplified Agile Project Management is Right for Small Teams, *Engineering Management Journal*, 27 (1), 2015, p. 9

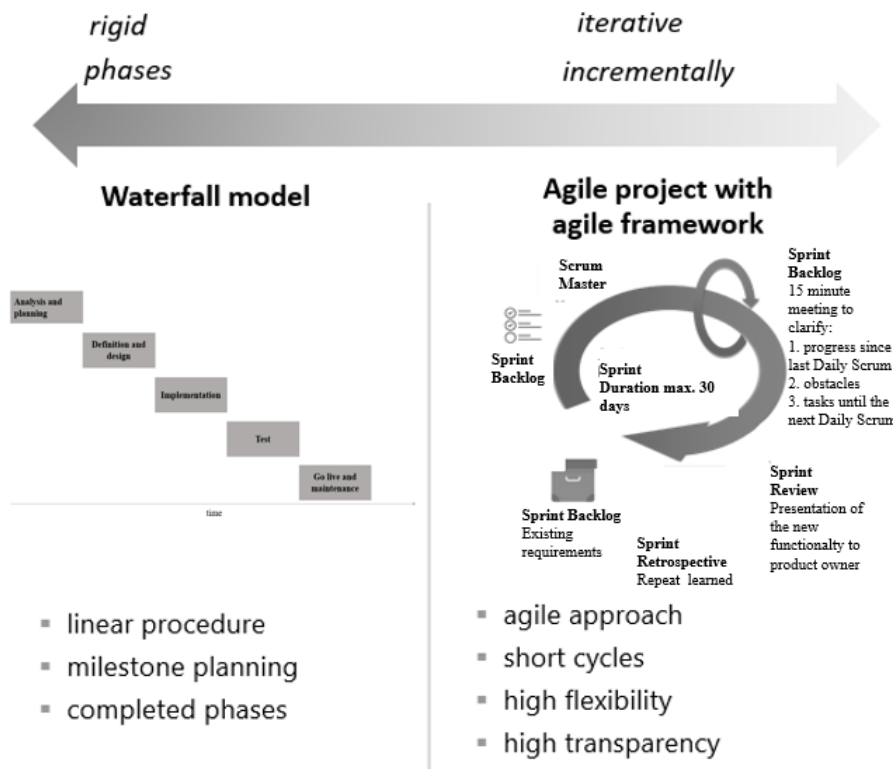


Figure 7: Structural differences of the waterfall model and agile model

Source: Authors illustration based on literature research

In the waterfall model, the phases are predefined, and the next phase can only be started after the first phase has been completed. The form of classic project management is based on a linear sequence of individual project phases. This procedure is considered rigid and requires a long planning time. Documentation of the individual phases is particularly important, which ensures transparency of project progress and expenses.

In contrast, the agile approach in projects is contradictory. Work is done in repetitive sprints, in short periods of time, and the result is built on the acquired knowledge¹²⁹. With the agile model there are no rigid phases, but the different stages take place simultaneously and functional products are created and tested in several iterations.

Projects over time have become more complex. According to Marrewijk et al. big projects

¹²⁹ El-Wakeel, F.: Further Demystification of agile Project Management, Technology Work Book, Strategy Finance/August 2019, p. 80

are very complex because of the size and contents high number of employees and stakeholders who are involved in projects¹³⁰. Classic project working way is not so effective in their purest form¹³¹.

There are challenges what can arise in the self-organised agile teams like miscommunication of the strategic aims, misalignment, and not enough commitment of the team to the decisions. Another risk is if team collaboration is not working because of conflicting priorities¹³².

The change process behind the term agile transformation aims to integrate the values and characteristics of agile work practice into the company. The companies should therefore become more sensitive to signals from their environment and be able to react proactively and flexibly to them in the future. For this, however, not only teams and structures must be revised, but also the agile mindset must be internalized. It is therefore important to shed light on the theoretical framework of agile transformation and to question why agile transformation is needed.

1.3 Theoretical analysis of agile transformation

Agility, digital change, and Industry 4.0 are terms that are currently represented in all areas and companies try follow this trend. New information and communication technologies, new production technologies and the further development of microelectronics are changing the world. They are considered to be a key driver of structural change. For this reason, the transformation process is not avoidable.

Agile work practice is now increasing attention in corporate management because in an ever more rapidly changing and uncertain world companies need new strategies in order to survive and thrive in competition¹³³.

¹³⁰ Van Marrewijk, A., Clegg, S. R., Pitsis, T. S., Veenswijk, M.: Managing public–private megaprojects: Paradoxes, complexity, and project design. *International Journal of Project Management*, 26 (6), 591-600, 2018, p. 591

¹³¹ Hertogh, M., Westerveld, E.: *Playing with Complexity. Management and organization of large infrastructural projects: AT Osborne/Transumo*, 2010

¹³² Drury, M., Conboy, K., Power, K.: Obstacles to decision making in Agile software development teams. *Journal of Systems and Software*, 85, pp. 1245– 1247

¹³³ Maarif, M., Shahar, S., Satar, N., Yusof, M: The Challenges of Implementing Agile Scrum in Information Systems Project. *Journal of Advanced Research in Dynamic and Control Systems*, 10 (9), 2018, pp. 2359

Gergs summarizes the changes in three dimensions: the constantly increasing speed of changes, the increasing digitalization and the increasing networking and associated globalization. These factors create a completely new management environment¹³⁴.

The situation on the market has changed from seller to buyer market because the fiercer the competition and the overcapacity in production areas are, the more increased the influence of buyers and at the same time reduced the influence of sellers. Customer quality awareness has increased, and an appropriate price-performance ratio is increasingly expected. This has increased economic pressure on companies¹³⁵. Flexible forms of work organization which break through the rigid requirements and allow the scope for action to be expanded are more likely to meet customers' demands for individual, high-quality and affordable products¹³⁶. As a result of the structural change the entire working and professional world is changing.

In this chapter transformational concepts would be described the approaches in terms of transformation, agile transformation, and the influencing factors to agile transformation.

1.3.1 Transformation concepts

The sense of transformation process applies to the whole organization and not only in units or departments. Transformation processes can be understood as a planned reshaping of a company's nucleus. They are often associated with a fundamental transformation of a company's relationship with individual stakeholders and with its economic and social environment.

In a transformation process, relationships with actors in an organization are fundamentally and sustainably redefined. This means that they always automatically affect the entire company - not just individual parts. Transformation processes can take place at different speeds and in different dimensions.

In a company transformation, there are always driving but also reluctant forces. This is not surprising, since transformation does not only take place on one level but get through the deepest core of the company.

¹³⁴ Gergs, H.-J.: Die Kunst der kontinuierlichen Selbsterneuerung. Weinheim: Beltz Verlag, 2016

¹³⁵ Solikin, M., Farid, A. A.: Transformational Leadership through Applied Neuroscience: Transmission Mechanism of the Thinking Process, International Journal of Organizational Leadership 7, 2018, pp. 212

¹³⁶ Wiendick, G.: Arbeits- und Organisationspsychologie. Berlin, München, 1994, pp. 206

According to Saliunas the organization is in the transformation process when there is a need to adapt to the changing environment and for this reason should be developed new skills and the need for the increase of organizational success¹³⁷.

Saliunas worked out three challenging points in the period of transformation:

1. Organization is in the working process so the transformation should be done while organization is working, corporate strategy alignment should be checked.
2. People: Employees have to understand and manage the impact of the transformation. Transformations evoke changes to the organization's structure, workforce, business processes, technological processes, or locations.
3. The scale and magnitude of transformation programs. All stakeholders have to be involved because they all pursue certain interests and for this reason must also be observed.

Of course, these steps have to be controlled and implemented, for this reason the right implementation strategy is very important, and leadership plays a crucial role when implementing and also deals with the stakeholders and tries to do justice to all interested parties. There are different approaches to involve senior leadership to the transformation management process.

Flamholtz and Randall defines transformation as a change from one state to another. The change can initiate transformation, but transformation is not the same as change. According to Fernandez and Rainey defines transformation as large-scale, planned, strategic and administrative change¹³⁸.

Chinthala and Narla described transformation more radically. They believe that through the transformation completely new things are created in which new business processes are defined and lived. This leads to the change of the mindset and the culture¹³⁹.

¹³⁷ Saliunas, J.: Transformation program management. PMI Global Congress, North America, Atlanta, GA. Newtown Square, PA: Project Management Institute, 2007, Source: <https://www.pmi.org/learning/library/transformation-program-management-7203> accessed 23. September 2021

¹³⁸ Flamholtz, E., Randall, Y.: Leading Strategic Change, Bridging Theory and Practice, Cambridge University Press, Cambridge, 2008

¹³⁹ Chinthala, G., Narla, S.: The hard side of business transformation: a holistic approach. International Journal for Innovative Research in Multidisciplinary Field, 3 (4), 2017, pp. 38-40

Dikert has compiled the results of a continuous review in his paper. There were 29 factors that contributed to successful transformation. He derived 11 points which ensure a successful transformation¹⁴⁰:

1. Leadership present the processes transparently, provide support, and give them the opportunity for further development.
2. Strong commitment to change.
3. Leadership that knows that change is essential for companies.
4. Piloting as a possibility to start an approach and achieve the first insights.
5. Training to teach agile methods and coaching the teams.
6. Integrate employees for establishing more agile supporters and including employees with agile experience.
7. Communicating the change as a positive experience of a change and make change transparent to all members.
8. Mindset change to agile values, communicating them, arranging meetings, establishing agile communities, and aligning the organization.
9. Self-organized and autonomous teams and allowing grass roots level empowerment.
11. Requirements management, what have the content of Product Owner role and communicate the importance of learning to define the requirements.

Hawkins and Fryling noticed that the successful transformation has the following priority on behaviour: “everyday practices that transcend the formal artefacts of traditional transformation efforts”¹⁴¹.

There are exactly some points that drive successful transformations: passion in the organization and willingness to operate better and differently and change the direction fast and efficiently if it is needed and go through the transformation in a sustainable way with active leaders.

The transformation process requires a strong structure which is clear. The procedure and processes should be presented and planned simply in the form of milestones and the progress

¹⁴⁰ Dikert, K., Paasivaara, M., Lassenius, C.: Challenges and success factors for large-scale agile transformations: a systematic literature review, *The Journal of Systems and Software*, 119, 2016, pp. 87-108

¹⁴¹ Hawkins, D., Fryling, T.: Redefining transformation, *People and Strategy*, 40 (2), 2017, pp. 47

must always be monitored. In the transformation process it is crucial that roles and responsibilities are defined.

De Waal and Chachage pointed out two important points of transformation:

1. Leadership paying dedicated attention to strengthening and the willingness and strongness to execute optimization targeted at these factors.
2. Leadership creating improved communicating in order to convey the importance of working to the employees¹⁴².

Fernandez and Rainey have worked out factors to ensure a successful transformation¹⁴³:

1. By leadership there should be a clear statement of the transformation in the company and the need should be communicated to the employees and external stakeholders.
2. Leadership should develop a strategy before starting the implementation of the transformation. Goals should be derived from the established strategy.
3. The presence and active participation of the leadership is crucial for the support of the transformation process and to reduce the resistance to transformation process.
4. Transformation can be successful if the top management commit and support the change processes.
5. Stakeholders have to support executing leaders.
6. A challenge lies in scarce resources by transformation implementing. The existing resources are needed for daily work, but a successful transformation needs sufficient resources.
7. Leaders and employees should integrate new processes into the daily work and effectively institutionalize and embed the transformation.

Their analysis is aimed entirely to the leadership. If the comparison worked out different authors who have worked out the points or steps for a successful transformation, it quickly

¹⁴² De Waal, A. A., Chachage, B.: Applicability of the high-performance organization framework at an East African university: the case of Iringa university college, *International Journal of Emerging Markets*, 6 (2) 2011, p. 148-167

¹⁴³ Fernandez, S., Rainey, H. G.: Managing successful organizational change in the public sector, *Public Administration Review*, 66 (2), 2006, pp. 168-176

becomes clear that the executive plays the decisive role and the decisive driver. Fernandez and Raines go so far that their 8 points focus entirely on the role of leadership.

In summary transformation in the company means change. The change can be exposed to very different needs for change. Currently and with reference to digitization, transformation is usually understood to be a comprehensive, profound and at best sustainable change in a company. In order to be successful, change must take place on two levels: a cognitive change and a related change in behavior.

Transformations in companies must therefore take into account both the structural and the cultural conditions, or the relationship and cooperation patterns in a company. This ranges from structures, processes and working methods to the essence and reason for existence of a company. In this context there is a reason for agile transformation. This means a new understanding of the market, customers, working methods and culture.

1.3.2 The direction of agile transformation

Transformation has the character of the unforeseen. The term transformation is used in different contexts. Agile transformation means that a company changes, so that agile work approach can be applied and thus contributes to the company's competence. The agile approach of handling projects in the company using agile methods does not yet mean agile transformation. The transformation not only includes methods but also the changed culture.

A successful agile transformation is a complex, long-term process that is supported by all people in the organization. Agile work approach requires methodological know-how as well as agile principles and values that are respected and lived by everyone involved. Ideally, this starts at the top: only when the changed attitude becomes noticeable and visible in the leadership type can the organizational culture develop holistically. Agile frameworks can provide orientation, but they only develop their full strength when they are tailored to the individual dynamics in the company.

An agile transformation only takes place if agile values and attitudes are internalized¹⁴⁴. Young also speaks of internalization: For a company that wants to change in the direction of

¹⁴⁴ Denning, S.: How to make the whole organization Agile. *Strategy and Leadership*, 43 (6), 2015, p. 15

agility it is crucial that employees and especially managers internalize and adopt the corresponding values¹⁴⁵.

Holbeche¹⁴⁶, for example emphasizes the importance of the mindset and the fact that agile work approach is more than a set of tools and methods. Real change requires a personal change in people's values, expectations, rituals, and behaviour. To do this a systematic change in the structures, processes and systems of the organization has to be carried out.

It is not enough to optimize or change strategies, structures, and systems. At the same time, the way of thinking that produced the old strategies, structures, and systems in the first place has to change. The second step is to analyse what agile status the various areas of the company have, and which areas are having to be developed.

In the chapters before, the agile approach was discussed. The following illustration shows the order of the agile approach. First the agile principles, followed by agile methods and then practices.

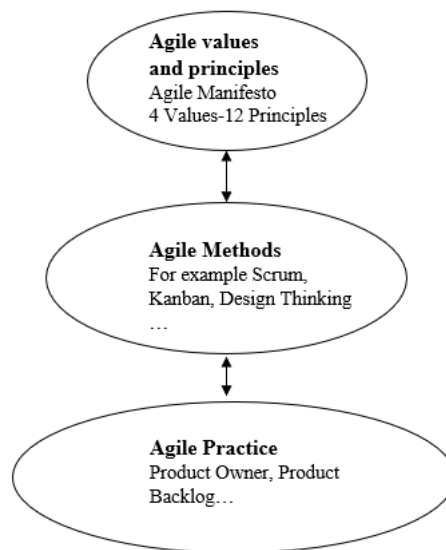


Figure 8: Agile approach beginning by agile values to agile realization

Source: Authors illustration based on literature research

¹⁴⁵ Young, A. G.: Identifying the impact of leadership practices on organizational agility. A Research Project Presented to the Faculty of The George L. Graziadio. School of Business and Management, Pepperdine University, 2013, p. 10

¹⁴⁶ Holbeche, L.: The Agile Organization: How to Build an Innovative, Sustainable and Resilient Business. London and Philadelphia: Kogan Page, 2015, p. 272

The illustration rather shows the rough course, which starts with values and continues through to practice. In this context, when these three levels are agile, it points to the agile transformation. Of course, the prerequisite is the performance of the company, the defined KPIs, which also show the results by changing in a positive direction.

Agile transformation is derived into three stages:

1. Planning the transformation.
2. Transposing the transformation.
3. Stabilizing the organization¹⁴⁷.

Agile transformation contains two ways of implementation: big bang and step-by-step. Step-by-step approach is often crystallised out as one of the success ways by piloting in the transformation period¹⁴⁸.

So, for this reason based on this fact the stepwise company transformation is recommended to the companies and is useful for all types of transformation and process optimizations. The step-by-step approach is more recommended than the big bang approach in large companies where the transformation process has to be implemented in the period of ongoing operation work. This way of implementation ensures that the attention is paid not only to separate topics but also to all important change topics.

The roles of leadership and strategy are also affected by the change process of the role of the leadership. Because from leadership not only technical competence is required but also the implementation of the company strategy, change management, collaboration, and communication. Agile transformation can completely re-shape the whole organization and for this reason a strong leader is required. The main responsibility is to develop a vision and the strategy of the implementation¹⁴⁹.

There are exactly some points that drive successful transformations: passion in the organization to create and shape processes differently; in the fast-changing market to change fast the direction if it needed and to go strictly to the transformation; and being proactive and

¹⁴⁷ Gareis, R.: Changes of organizations by projects. *International Journal of Project Management*, 28, 2010, pp. 323

¹⁴⁸ Dikert, K., Paasivaara, M., Lassenius, C.: Challenges and success factors for large-scale agile transformations: a systematic literature review. *The Journal of Systems and Software*, 119, 2016, pp. 87-108

¹⁴⁹ Westerman, G., Bonnet, D., McAfee, A.: *Leading digital : turning technology into business transformation*. Harvard Business Review press, Boston, Massachusetts, 2014

active leaders. The change to agility is therefore a natural and normal process.

Change Management in context of agile transformation is defined as steering and implementing change successfully in a company toward a specific outcome¹⁵⁰.

Regardless of whether the change is initiated top-down or bottom-up the change in mindset comes first. Nowotny describes the agile mindset as follows: away from profit thinking, hierarchies, control, long-term planning and closure, towards meaning, networking, empowerment, trying out and transparency¹⁵¹.

According to Gareis there are four types of organizational change regarding to the purposes, need for change and readiness for change of the considered organization: - companies readiness to learn; - further development; - companies transformation; and - radical new placement¹⁵².

The following illustration based on Gareis shows the logical way of transformation.

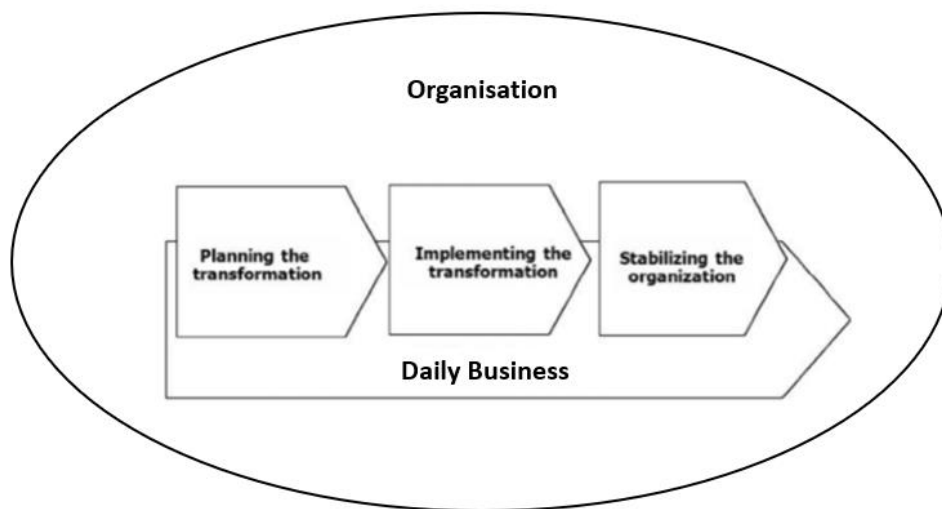


Figure 9: Process of a transformational change

Source: Author`s illustration based on Gareis¹⁵³

¹⁵⁰ Owen, S.: The Role of Change Management in Digital Transformation, 2016

¹⁵¹ Nowotny, V.: Agile Unternehmen – fokussiert, schnell, flexibel: Nur was sich bewegt, kann sich verbessern. 3. Auflage. Göttingen: Business Village GmbH, 2017

¹⁵² Gareis, R.: Changes of organizations by projects. International Journal of Project Management, 28, 2010, p. 318

¹⁵³ Gareis, R.: Changes of organizations by projects. International Journal of Project Management, 28, 2010, p. 323

First of all, the transformation should be planned, then implemented. After the implementation in sense of sustainability there is a stabilization phase.

Gandomani and Nafchi believe that it is not enough to focus on the performance of a company, but also to develop strategies that, like the human aspect, control the challenges, such aspects as changing organizational culture, and their negative influence or result on the transformation¹⁵⁴. Wendler also believes that special attention should be paid to cultural change during the transformation¹⁵⁵.

Dikert et al., propose on their literature review to characterize the adoption of agile methods at large as a large-scale agile transformation¹⁵⁶. If few practitioners use the term to characterize the implementation of a scaled framework at the project level, the agile transformation is a process where a large organization will change the information systems development methods from a plan-driven process to an agile development process on a large perspective including changes in how different teams involved in projects are organized¹⁵⁷.

The adoption of a management innovation in organizations is defined as a process that delineates how the organization selects and uses a practice for the first time. The adoption process can be divided into three general phases of initiation, decision, and implementation. The adoption process can therefore be considered as a progression of orderly sequential phases¹⁵⁸.

According to Goldman agile companies are divided into four strategic levels: customer satisfaction, secure acting with uncertainties, be more competitive through strong collaboration and lever force of key employees and information¹⁵⁹.

Companies that can't quickly react to new customer requirements can't exist long time under

¹⁵⁴ Gandomani, T. J., Nafchi, M. Z.: Agile transition and adoption humanrelated challenges and issues: A grounded theory approach. *Computers in Human Behavior*, 62, 2016, pp. 257-266

¹⁵⁵ Wendler, R.: Dimensions of organizational agility in the software and IT service industry: Insights from an empirical investigation. *CAIS*, 39 (21), 2016, pp. 439 – 482

¹⁵⁶ Dikert, K., Paasivaara, M., Lassenius, C.: Challenges and success factors for large-scale agile transformations: A systematic literature review, *Journal of Systems and Software*, 119, 2016, pp. 87–108

¹⁵⁷ Paasivaara, M. et al.: Integrating global sites into the lean and agile transformation at Ericsson” *Proceedings - IEEE 8th International Conference on Global Software Engineering*, Bari, Italy, 2013, pp. 87-108

¹⁵⁸ Hecker, A., Ganter, A.: The influence of product market competition on technological and management innovation: Firm-level evidence from a large-scale survey. *European Management Review*, 10 (1), 2013, pp.17-33

¹⁵⁹ Goldman, S., Nagel, R., Preiss, K.: *Agile Competitors and Virtual Organizations: Strategies for Enriching the Customer*, Van Nostrand Reinhold, New York, NY, 1995

the global und local competition pressure. Agile values and agile work practice gives a chance to find a solution for the volatile global market conditions. The leadership of companies can therefore establish agile strategies and agile way of working through entire company. This way enables development of innovative approaches to lever force existing expertise to anticipate and fulfil changing customers' needs¹⁶⁰.

Big companies are still hierarchical but to stay in the competitive market it is crucial to require customer alignment and decentral decision-making. The processes should be reinvented with leadership roles, existing company values, work practices and communication channels to ensure successful transformation.

Rigby, Sutherland, and Noble¹⁶¹ worked on a framework for agile transformation:

- Organizational structure: Change of the structure to product-oriented team structure.
- Financial processes: Dynamic budgeting based on strategic aims.
- Delivery processes: Change from phase-oriented delivery project based on specifications to project implementation working in iterations.
- Performance measures: Attention on compliance on team and value measures.
- Mandate: Strategic frame from managers to product teams.

Agility itself promotes a continuous state of change. New movements in organizations call for sustainable organizational change infrastructures and increased reliance on creating communities of stakeholders¹⁶².

Therefore, the under-exploration of agile culture transformation frameworks and sustainable change within organizational cultures warrants further research on pragmatic and comprehensive frameworks for shaping organizational culture conducive to agile transformations.

In the changing period it is more important to use an effective method and rethink the way of working. There is increasing talk of agile methodology. Agile procedures are used in projects, but it is not an explicit company goal to change the organizational structure. Accord-

¹⁶⁰ Meredith, S., Francis, D.: Journey towards agility; the agile wheel explored, *The TQM Magazine*, 12 (2), 2000, p.140

¹⁶¹ Rigby, D. K., Sutherland, J., Noble, A.: Agile at scale. *Harvard Business Review* 96 (3), 2018, pp. 88–96

¹⁶² Jick, T. D., Sturtevant, K. D. M.: Taking stock of 30 years of change management: Is it time for a reboot? *Emerald Publishing Limited*, 25, 2017, pp. 33-79

ingly, the hierarchical organizational structure and agile project structures coexist. This approach leads to isolated solutions of the agile approach and for this reason agile transformation cannot be questioned.

The agile transformation follows not only methods but also values and principles. This leads to the new mindset and change to self-managing teams, which requires a re-orientation for all the company and not only for the project or team employees. This way of working includes an agile mindset in order to be an agile organization.

According to Berkani et. al agile transformation goes beyond the simple adoption of agile practices and some organizations clearly state that their aim is to become an “agile enterprise”. Studies about agile transformation are still scarce, and the term “agile transformation” seems ambivalent¹⁶³.

Measey says “agile is a journey, not a destination and the best the organization can hope for, is that teams become more agile by embedding the agile mindset deeper inside themselves and the organization”¹⁶⁴. This transition is a long going process and requires recourses and leadership attention on managing and developing standard teamwork methods and values like trust and unit approach in order to go through the transition successfully.

With the agile implementation challenges can arise and it can be very difficult to implement because it has to deal with existing culture, resistance to change¹⁶⁵. Küpper et al.¹⁶⁶ have noted that research on details that support a systematic development of an agile culture is rare. They have identified a gap in agile organizational culture research regarding systematic strategies and change.

According to Denning, completing an agile shift throughout the whole organization typically involves transforming the corporate culture, and this is a large-scale and difficult mission.

¹⁶³ Berkani, A., Causse, D., Laurent, T.: Triggers analysis of an agile transformation: the case of central bank. *Procedia Computer Science* 164, CENTERIS – International Conference on Enterprise Information Systems, 2019, pp. 450

¹⁶⁴ Measey, P.: *Agile Foundations : Principles, Practices and Frameworks*. (Radstad, Ed.). Swindon, SN2 1FA, UK: BCS Learning & Development Ltd., 2015, pp. 12

¹⁶⁵ Campanelli, A. S., Parreiras, F. S.: Agile methods tailoring – A systematic literature review. *Journal of Systems and Software*, 110, 2015, p. 86

¹⁶⁶ Küpper, S., Kuhrmann, M., Wiatrok, M., Andelfinger, U., Rausch, A.: Is there a blueprint for building an Agile culture? *Proceedings of the Projektmanagement und Vorgehensmodelle*, Darmstadt, Germany: Gesellschaft für Informatik (GI) e.V., 2017

Feedback culture, openness to failures and learning from failures are important for the continuous improvement of the company. The process of improvement is iterative and contains adjustments as well. According to volatile market companies are expected to be agile but it contradicts the existing fixed mindset where failures are not allowed¹⁶⁷.

One cannot ignore today's digital change because it is the driver of agile transformation and of the dynamics of change. The company is also changing due to the changing requirements of the environment. For example, the dynamic of change increases the pressure to adapt to the changing market in order to stay competitive.

Drivers of this increased pressure to innovate and change include shorter production cycles, price erosion, falling barriers due to digital products and a related shorter strategy horizon. Since not only the speed of change is increasing but also the extent and effect of change, organisations must be able to change proactively continuously in a highly dynamic and complex environment¹⁶⁸.

Agile approach influences organizations as a whole as in order to implement agile approach and also to change the organisational mindset in form of values, goals and resources. The important factor is that there is a trust not a control for the talents and capabilities of the employees. It is necessary to control implicit distrust in people or their work.

1.3.3 Influencing characteristics of agile transformation

Companies have their daily classical routine business processes but are also increasingly faced with new topics such as short innovation cycles and digitalization. Companies are there to develop new technologies such as sensor technology in the manufacturing environment, but also artificial intelligence or cloud solutions.

Exactly these innovative topics cannot be planned and carried out in the classical sense. Therefore, the whole development process has to be constantly adapted and reverified. For this reason, it makes sense to bring the necessary flexibility into such projects and to work agile in this sense. However, even in such projects there is the risk of running the projects

¹⁶⁷ Johnston, I.: Creating a growth mindset, *Strategic HR Review*, 16 (4), 2017, pp. 155-160

¹⁶⁸ Greening, D.: Release duration and enterprise agility. *System Sciences (HICSS)*, 2013 46th Hawaii International Conference on, 2013, pp 4835–4841

according to the hierarchical principle, which has the consequence that it is deprived of any kind of creativity.

In the organization with changing requirements also processes are changing, and this has an affection /influence on employees and managers. This newly changing processes and requirements force individual education, rethinking of a situation and doing different tasks and fulfill new requirements. One job position has a content of different tasks and for this reason employees don't have only one task for what they have a responsibility. Because today's working and professional world is characterized by upheaval and crisis situations and by directional changes for example in necessary changes of profession and location¹⁶⁹.

In the course of the theoretical discussion, the author of this thesis has elaborated possible influencing characteristics that influence agile transformation, which can be found in several studies. Each of the factors listed below favors the transformation. Agile transformation depends on how successful they are in the sense of the agile approach.



Figure 10: Six influencing characteristics of agile transformation in companies

Source: Author's illustration

Agile transformation has several influencing factors. In the previous chapters in this thesis were covered topics such as leadership type, methods and agile transformation. Infrastructure and competencies are also important factors in the process of agile transformation.

¹⁶⁹ Solikin, M. J., Farid, A. A.: Transformational Leadership through Applied Neuroscience: Transmission Mechanism of the Thinking Process, International Journal of Organizational Leadership 7, 2018, pp. 211-229

The various factors have the following context:

1. Organization: self-organized teams and employees, decentralized steering, and the way of working with focus on networking between agile teams.
2. The special focus is on leadership. Managers serve as coaches. New employee development schemes and their employees give high autonomy and decision making within teams.
3. Method: High self-empowerment and self-organization. Support and further establishment of teamwork, agile working methods.
4. Competencies: Broad competency development regarding agile methods to all employees. Qualification and development of agile coaches and management.
5. Infrastructure: Reconstruction office space concepts, which allow the introduction of new collaboration tools.
6. Culture: Customer oriented processes. Transparency throughout the company. Open communication.

A focus on these characteristics this chapter will deal with and are supported by several studies.

Shaping and implementing the agile transformations requires a highly qualified and motivated working force, which generates new proposals through a continuous exchange. The engaged behavior of managers as well as of teams have, therefore, a decisive success influence.

Following the agile principles of "early and regular delivery" and "inspect and adapt", agile transformations do not start large-scale. They start with pilots and experiments. This naming already implies that the first steps can also fail or only partially turn out to be the right steps. It helps to get involved in experiments much more quickly. It makes the step into transformation easier, and the first successes come much faster.

For the agile transformation it has proven to be effective to proceed step by step when introducing agile concepts: Start with a pilot project or pilot area. With the positive experiences from the piloting, agile working methods are gradually transferred to other areas.

Regarding the implementation, the agile process model has established itself in recent years,

in addition to the classic procedures usually structured processes. This is done for a specific reason, that agile processes have proven themselves in companies and offer an approach to today's business environment. However, not every company can quickly adopt and apply the agile approach. The size of the company, but also the approach that has been anchored up to now, is decisive for this.

For companies that work mostly on a project basis, agile transformation often means moving from individual projects or teams working with frameworks such as scrum to entire departments or even the whole company is working in an agile way. If individual teams or projects in a company work successfully with agile approaches such as scrum, the question often arises as to how these can be used across projects or departments or even for large projects.

In this chapter were analysed leadership types regarding to agile transformation. Agile work practice was described by Scrum method and agile project management and the relationship to agile transformation was determined.

In summary, this chapter of review of literature has been proven that agile transformation is a specific type of organizational change with its own unique way of implementation. Leadership and especially a leadership type are important for agile work practice and agile transformation. Its dynamic nature requires a more holistic approach and not just focus on the technical aspect of the transformation but more on the human aspect that transforms the organization. In this case the culture of the organization has also been described in which values are created and developed and leaders and employees adjust values and implement the company culture. In order to substantiate the theoretical findings, the author of this thesis would like to take this up in chapter three and explore it empirically by analysis of companies more than 48.00 employees. The author explores if there exists agile work practice in these companies and if agile transformation is already happening. Additionally, the author of this thesis wants to determine if in companies one leadership type predominantly exists with influence on agile transformation.

2 THE ACTUAL STATE OF LEADERSHIP IN COMPANIES WHICH ARE IN AGILE TRANSFORMATION

Entrepreneurship in decentralized structures, global orientation, permanent pressure for change and adequate leadership are challenges that arise for executives and working staff. They have to be flexible to enter into economic and social changes and to look ahead for actions.

Through complex IT solutions and connections, a new working model is emerging in enterprises, which is increasingly oriented on processes. Justified by the high complexity, almost no one is a full specialist in a thematic field. With the rising specializations, the number of differentiated activities is rising, and the leadership role is changing. The shift is being made from a control function to a coaching and supportive one to serve as samples for the highly qualified staff members.

However, not only managers or the employees undergo the transformation and form a decisive factor for the change, but also the culture needs to be reassessed and newly defined. The organizational culture can be influenced by the management and is, therefore, a management task. The particular contribution takes place in the form of perceptions and behavior patterns towards innovations or new ways of working¹⁷⁰.

According to the Standish Group's 2012 study "The Chaos Manifesto"¹⁷¹ deals with the success and failure factors in IT projects. It is one of the best-known and most important long-term studies in the field of project management; since 1994, more than 40.000 individual projects have been scientifically examined.

The conclusion of the study is that agile projects are three times more successful than projects implemented in the classic waterfall model. Agile projects have low number of failed projects in comparison to classic projects. Waterfall projects fulfill only in parts requirements from customer.

By comparing the waterfall model with the agile approach, the study comes to the following conclusion: 14% of the projects are successful with the waterfall model, with 42% with the

¹⁷⁰ Gobble, M.: The Importance of Management Innovation, *Research-Technology Management*, 61(6), 2008, pp.58-61

¹⁷¹ The Standish Group's 2012 study: "The Chaos Manifesto" 2012, pp.1-64, Source: <https://cs.calvin.edu/courses/cs/262/kvlinden/resources/CHAOSManifesto2012.pdf> accessed 25. October 2021

agile approach. 29% of the projects failed with the waterfall method and only 9% with using the agile approach¹⁷².

Agility in a framework of agile project management and the agile approach have an increasing attention in more and more companies. Due to the competition of the markets and the rapid changes in the business environment, the project management and the procedure have to adapt to this situation as well.

The focus of these changes in a complex world is still the human being today and will remain so in the future. The greater the change, the more people are affected. Accordingly, many people must first be convinced of the need for change¹⁷³.

So, in this chapter the current situation in enterprises will be described. At first the influencing factors of agile transformation with the focus on leadership behavior and culture.

2.1 Status quo of agile transformation in companies

Companies are faced with the challenge of reacting to the new uncertainties prevailing on the market and developing innovations alongside their core business. The speed with which innovations reach the market while taking quality into account counts more than ever today, and no company can afford lengthy product development cycles that sometimes take years or forget the customer benefits in the course of the process.

In the history there is a successful example of a transformation: The manufacturing concept known as lean production (flexible production), like flexible manufacturing, is a direct answer to the mass production system and already contains many characteristics of agility. This is an example for a change process that was already successfully implemented.

Adapted to the changing market conditions there was a large variety of products and small quantities of products in the Japanese market. After a thorough analysis of Ford's manufacturing facilities, board of Toyota have concluded that the principles of mass production at Toyota in Japan cannot be implemented in this way. From this situation they have taken over the already established flow production as a basis, however, the work processes should

¹⁷² The Standish Group's 2012 study "The Chaos Manifesto" 2012, p. 6-10

¹⁷³ Maximini, D.: Scrum Einführung in der Unternehmenspraxis. Von starren Strukturen zu agilen Kulturen Springer-Verlag Berlin Heidelberg 2013, p. 53

be reconsidered and thus further developed using the continuous improvement process¹⁷⁴.

In addition, the lot sizes were successively reduced in order to reduce the interruption of the processes and the associated high inventory costs. On the other hand, it was possible to react more flexibly to the fluctuating market and individual customer requirements¹⁷⁵.

In 1985 the International Motor Vehicle Program scientists from the Massachusetts Institute of Technology researched the differences and main factors of the production of Japanese, US and European vehicle manufacturers "The Machine that Changed the World" -Womack et al. 1993. The research emphasises the principles and main methods of the lean management in the Toyota production, as a sustainable answer to classic mass production.

The main approach contents the main concentration on the satisfaction of customers and the work on the continuous improvement by avoiding waste and increase of process flexibility. This approach in the implementation leads to sustainable changes in the companies.

Like every model, lean management has criticisms that need to be worked on. At this point, however, there was already growing criticism of the manufacturing concept of lean production which aimed at overloading workers, high fluctuation rates and a poor environmental concept^{176,177}.

Agile work approach is important for companies in competitive and changing environment¹⁷⁸ with benefits including early returns on investment, improved product quality, and enhanced client relationships. In addition, team members of organizations with a high level of agile proficiency tend to be happier, further engaged, and inventive, creating increased value for both the company and its customers¹⁷⁹.

¹⁷⁴ Womack, J. P., Jones, D. T.: Lean thinking: banish waste and create wealth in your corporation: Simon and Schuster, 2010

¹⁷⁵ Liker, J. K.: The Toyota way. 14 management principles from the world's greatest manufacturer. New York, London: McGraw-Hill 2003, pp. 21

¹⁷⁶ Steinkühler, F.: Für eine demokratische und soziale Unternehmensreform: gewerkschaftliche Antworten auf die japanische Herausforderung. Hans-Böckler-Stiftung, Lean Production Baden-Baden: Nomos, 1992, p. 21

¹⁷⁷ Nomura, M.: Toyotismus am Ende? Zur Reorganisation der "schlanken Produktion" in der japanischen Autoindustrie. Hans-Böckler-Stiftung, Lean Production, BadenBaden: Nomos, 1992, pp. 55

¹⁷⁸ Wendler, R., Stahlke, T.: What constitutes an agile organization? Descriptive results of an empirical investigation, Technische Universität Dresden, Fakultät Wirtschaftswissenschaften, Dresdner Beiträge zur Wirtschaftsinformatik, 68 (14), 2014, pp. 9

¹⁷⁹ Grant, T.: Agile in the real world: Gone mainstream, creating bigger waves, making course corrections, 2013

For this reason, companies try to create an attractive environment, which stimulates openness towards an agile working style moving apart from the ordinary methods and tasks fulfillment.

The Lünendonk study surveyed large companies with all managers taking part. For this Lünendonk study, 26 large companies and companies with a turnover of one billion euros were interviewed in September 2018. The study participants are predominantly executives from the CEO area as well as managers who are jointly responsible for the agile transformation in their companies.

In Lünendonk's understanding, an agile transformation is characterized by the elements "collaborative communication methods", "close cooperation between departments", "IT and external partners", new organizational structures" and "adaptation of the corporate culture". 23% of the study participants already fulfil the prerequisite of agile transformation but 65% are only at the beginning of the change process and only use agile methods in selected areas.

The classic hierarchical structures are also in the process of dissolution. This means that managers and employees have to evolve from a directive-oriented to a self-oriented role. Leaders must also exemplify an agile mindset. Above all, an agile transformation needs a lot of time, empathy, and the willingness of the employees, as well as the right way of dealing with resistance.

According to the study, the transformation in large companies has already begun. This is because 42% of the companies have already converted their organization and processes to the cooperation of several teams and possibly also external service providers as agile teams. A further 67% also believe that they live in a continuous improvement process in the development teams and thus continue to promote an agile approach within the organization¹⁸⁰.

One of the first studies on this comes from Denison. He demonstrated a cross-industry connection between organizational culture and success factors such as "return on investment" and "return on sales" using a large-scale survey with over 40.000 respondents¹⁸¹.

¹⁸⁰ Bridging IT: Lünendonk-Studie: Menschen Methoden Lösungen: Scalable Agility. Von der agile zur digitalen Transformation, 2019, pp. 5-8

¹⁸¹ Denison, R. D.: Research study Bringing Corporate Culture to the Bottom Line in Organizational Dynamics, Organizational Dynamics 13 (2), 1984, pp. 10-22

Calori and Sarnin also show a positive relation between organizational culture and company's performance. A company's growth seems to benefit more from a corresponding culture. A questionnaire on work-related values and management practices was developed and tested on 260 individuals in 5 companies. The work-related values measured included attitude toward change, internal cooperation, self-fulfillment at work, societal contribution, integrity, individuals' relation to the company, internal competition, and personnel involvement¹⁸².

Another recent survey by Version One in 2018 shows that a contradiction of corporate culture with agile values is perceived as the greatest barrier for the achievement of agile transformation¹⁸³. The survey had a questionnaire to the persons from global software community, so 1492 answers were collected and evaluated. Along with other aspects, this is essentially seen as an appeal to the leadership to implement a corresponding corporate and management culture and to convincingly represent it for the support of managers and represent bindingness. Leadership's unreserved belief in the meaningfulness of the transformation is a prerequisite¹⁸⁴. At this time there is a fact that agile approach continues to grow but is still 78% of respondents have not adopted agile practices¹⁸⁵.

But the increasing tendency is explained by the fact that the benefits resulting from the adoption of the agile approach crystallize. According to the agile reports the following benefits were mentioned:

¹⁸² Calori, R., Sarnin, P.: Corporate Culture and Economic Performance: A French Study, *Organization Studies* 12 (1), 1991, pp. 49-74

¹⁸³ VersionOne: The 12th annual State of Agile report [E-Reader Version]. 2018, pp. 1-16, Source: <https://explore.versionone.com/state-of-agile/versionone-12th-annual-state-of-agile-report>. accessed 28. September 2021

¹⁸⁴ Lasnia, M., Nowotny, V.: Agile Evolution. Eine Anleitung zur agilen Transformation. Göttingen: Business-Village. 2018, p. 52

¹⁸⁵ Version one survey: "The 13th annual state of agile report", 2019

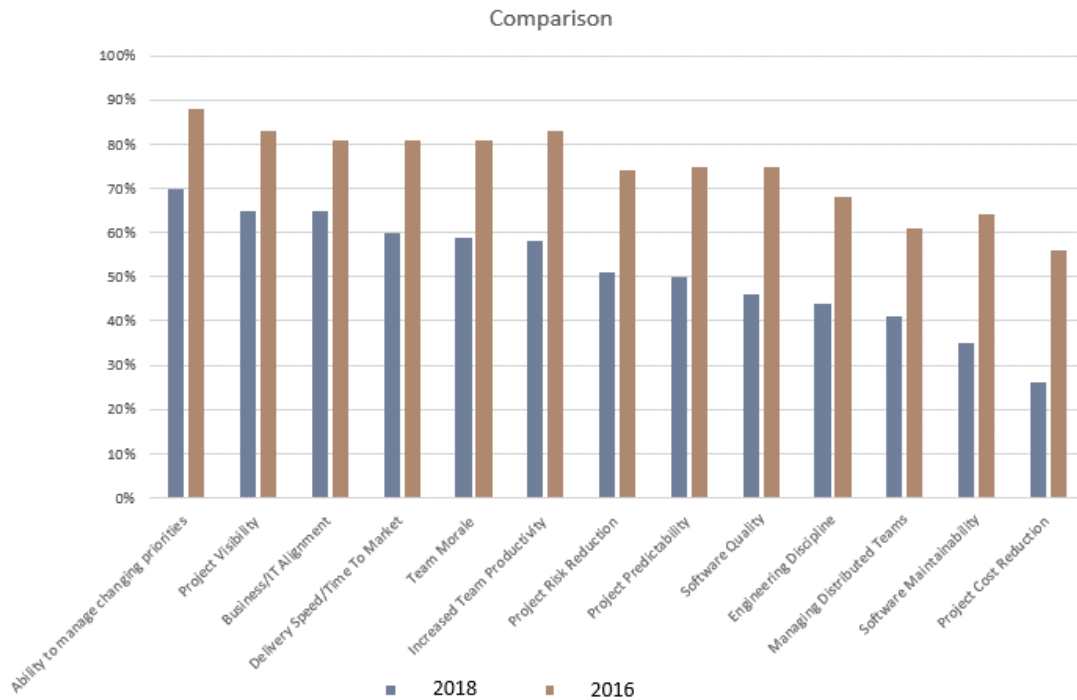


Figure 11: Benefits as measurable factors resulting from agile transformation. Comparison 2016 & 2018

Source: Authors illustration based on reports of Version One¹⁸⁶

It is surprising that the figures were higher in 2016 than in 2018. 69% of companies in 2018 clearly state that exactly the ability to change priorities is the reason for the adoption of the agile approach. Also, there is high percentage by project visibility. The projects are getting more complex and for this reason the transparency is getting more and more important. In this case agile approach supports transparency.

The surprising finding is that while most companies focus their agile work approach on project management and solution development, the front runners focus instead on agilization of the processes. 75 percent of the frontrunners state that their processes (especially planning, budgeting and resource allocation) are flexible enough to be able to respond to changing priorities within the organization.

Another difference between the frontrunners and the rest of the respondents is that two-thirds of the frontrunners have established decision criteria for the use of agile methods and

¹⁸⁶ 1. VersionOne: The 12th annual State of Agile report [E-Reader Version]. 2018, pp. 1-16, Source: <https://explore.versionone.com/state-of-agile/versionone-12th-annual-state-of-agile-report.>, accessed 26. December 2020

2. The 10th annual State of Agile report [E-Reader Version]. 2016, pp. 1-16, Source: <https://explore.versionone.com/state-of-agile/versionone-10th-annual-state-of-agile-report.>, accessed 26. December 2020

do not necessarily aim for the highest possible proportion of agile projects in their portfolios¹⁸⁷.

According to the different studies the key point is not in the quantity, in how many agile projects the company has implemented or how often the agile methods have been applied, but the key to success lies at a deeper level. The values, mindset and behavior are also very important.

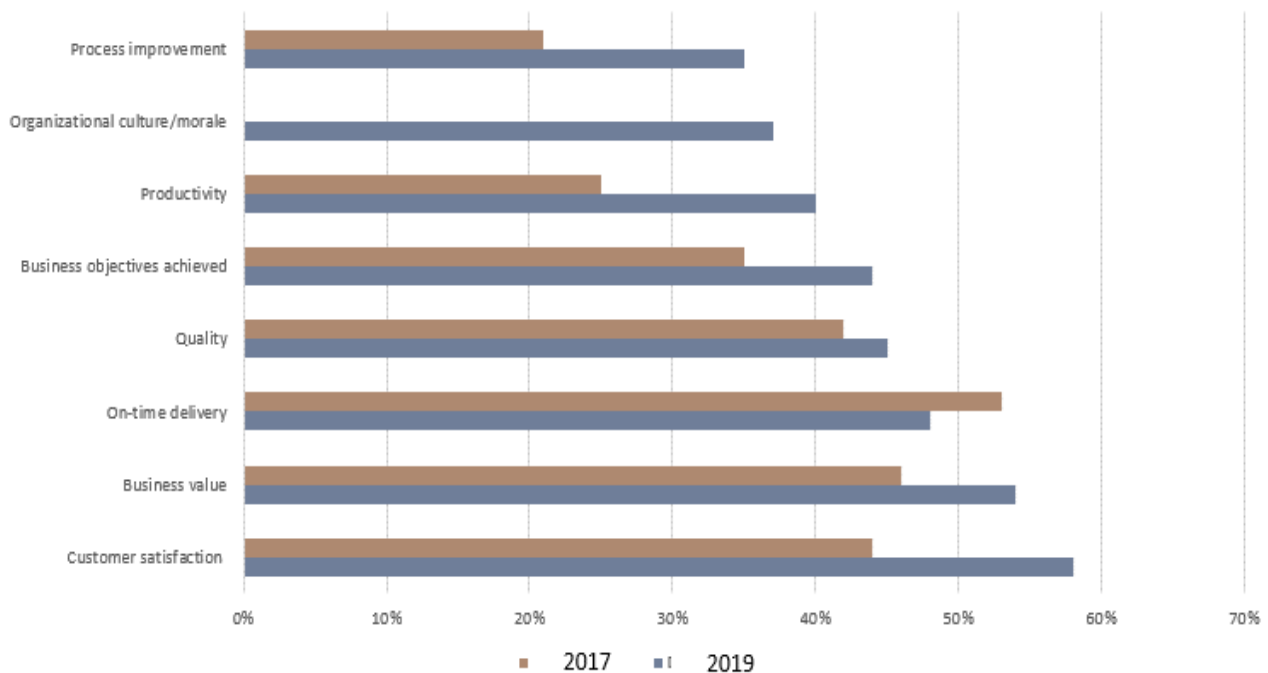


Figure 12: Success outcomes from an agile transformation in comparison 2017 &2019

Source: Author`s illustration based on VersionOne reports¹⁸⁸

When asked how organizations measure success of agile transformation, there are some criteria. In 2019 it was customer satisfaction and business value but in 2016 it was on-time delivery and also business value. Interesting finding is that organizational culture was also measured but only in 2019.

¹⁸⁷ 1. Swissict: Studie: Agilisierungsinitiativen 2019, Source:<https://www.swissict.ch/studie-zeigt-agilisierungsinitiativen-werden-in-zwei-von-drei-faellen-falsch-angegangen/>, accessed 24. January 2021

¹⁸⁸ Version one: The 11th annual State of Agile report [E-Reader Version]. 2017, Source: <https://www.agile247.pl/wp-content/uploads/2017/04/versionone-11th-annual-state-of-agile-report.pdf>, accessed 24. January 2021

2. The 13th annual State of Agile report [E-Reader Version]. Source:<https://www.collab.net/news/press/collabnet-versionone-releases-13th-annual-state-of-agile-report>, accessed 24. January 2021

So, in this case the internal culture of the company is getting more important as it was in 2017. Business value delivered with 42% and customer satisfaction with 46% remain the two main factors what measuring success in individual projects.

The general problem has been that agile transformations in organizations are subject to several challenges, barriers and research often lacks an organizational perspective on agile approach¹⁸⁹.

Although barriers to agile transformation are multifaceted, organizational cultural issues and general resistance to change should be considered significant impediments to full transition to agility and achievement of sustainable organizational agile approach¹⁹⁰.

VersionOne’s Annual State of agility report¹⁹¹, the largest and longest-running agility survey for agility trends has found out that organizational culture, general resistance to change and insufficient management support are reasons for missing success of agile projects and for further agile development.

The following table shows in percentage increasing number of factors that hinder the agile transformation.

Table 3: Failure causes and barriers to agile adoption in percent in comparison 2015-2020

Years of studies	Company philosophy or culture at odds with core agile values	Lack of support for cultural transition	Lack of skills/ experience with agile methods	Ability to change organizational culture	Lack of management support	General resistance to change
2015	42	36	44	44	29	34
2016	46	38	41	55	38	42
2017	52	n/a	40	63	45	43
2018	53	n/a	41	n/a	42	46
2019	52	n/a	41	n/a	44	48
2020	44	n/a	41	n/a	43	48

Source: Author’s creation based on VersionOne’s annual reports

¹⁸⁹ Wendler, R.: Dimensions of organizational agility in the software and IT service industry: Insights from an empirical investigation. CAIS, 39 (21), 2016, pp. 439-482

¹⁹⁰ Hoda, R., Noble, J.: Becoming agile: a grounded theory of agile transitions in practice. In Proceedings of the 39th International Conference on Software Engineering (pp. 141-151). IEEE Press, 2017

¹⁹¹ VersionOne’s Annual State of Agile Report: Comparison: 2013; 2014; 2015; 2016; 2017; 2018; 2019

This table is from VersionOne's annual report and contains the analysis of five years of the top reasons for unsuccessful agile projects and barriers for agile adoption during the years 2015-2020. The values of the top challenges and obstacles in percent show that the values have not only remained constant but also increased. Most years present an increase of a company culture clashing with agile values, lack of support for cultural transition, and lack of management support for agility adoption, as well as a steady general resistance for change.

The study and the analysis show that migrating to the agile way is not only about substitution of technologies, methods, and the way of working but it also affects the organizational change to a major extent.

An organizational culture supporting the innovative behavior of its employees is considered as one of the most important competition factors for all innovative companies. Such an organizational culture supports a positive attitude towards changes and the contribution and realization of new ideas. The implementation is proceeded by the leadership as the leader is considered to be the decisive driver¹⁹².

Managers agree that lonely decisions and ready-made concepts are no longer appropriate given the complex dynamics of globally networked markets. All 400 managers interviewed have named the ability to deal with open-ended processes as a central characteristic of "good leadership". The willingness to deal with the uncertainty of joint search movements is attributed significantly more importance than management via target agreement and controlling, transparency, empathy, and cooperation.

According to the study by Roghé, Scholz and Schudey¹⁹³, effective cooperation is demonstrated, for example, by clearly defined responsibilities, simple decision-making processes or a results-oriented meeting culture. Also important is the management style, which explicitly promotes cooperation among employees. This is based on managers who focus on assessing and promoting cooperative behavior, clear team KPIs, performance management that supports cooperation, and corresponding personnel development processes. Organiza-

¹⁹² Dikert, K., Paasivaara, M., Lassenius, C.: Challenges and success factors for large-scale agile transformations: A systematic literature review. *Journal of Systems and Software*, 119, 2016, pp. 97-98

¹⁹³ Roghé, F, Scholz, S, Schudey, A.: Organisation im 21. Jahrhundert. Eine Studie identifiziert sechs Erfolgsfaktoren, *Zeitschrift Führung und Organisation*, 86 (4), 2017, p. 244-249

tions that take these factors into account and thus promote cooperation can double the probability of success in terms of margin and growth¹⁹⁴.

For example, in the agile mindset, a team's failure can still have positive consequences on the impact on the company's success if the teams learn from their mistakes during iterative development processes and take them into account in the next steps. Thus, "failure" is explicitly provided for in the agile process model scrum. The current trend is to focus more on the purpose of the project and less on key figure-oriented project management, where failure is usually not tolerated.

There are different strategies for how the surveyed companies approach their agile transformation. For example, there is often the evolutionary process, in which a number of employees and managers from lower management introduce agile approaches such as scrum in their areas and gradually introduce them into the organization in a bottom-up approach.

On a positive note, 67 % of companies attach significantly more importance to change management and behavior transformation than in the past - a very important prerequisite for mastering the switch to self-organizing units and thus for agile transformation¹⁹⁵.

The implementation of the agile principles only works under certain conditions. Companies without an attractive vision of the future, without a vital mission statement and a stable value landscape find it difficult to make agile work approach a future-oriented value in their culture.

The attitude of employees has also changed and both employees and managers are looking for a sense of purpose in their work and are demanding more self-direction and self-organization coupled with the flat hierarchical network structure. The bottom line is that companies are moving further and further away from the previous way of doing things, which in many respects focused on centralized and hierarchy-oriented structures.

2.2 Agile work practice and agile transformation in companies

Agile methods have been gaining in importance for some time now. Of course, in complex

¹⁹⁴ Roghé F., Scholz, S, Schudey, A.: Organisation im 21. Jahrhundert. Eine Studie identifiziert sechs Erfolgsfaktoren, Zeitschrift Führung und Organisation, 86 (4), 2017, p. 244-249

¹⁹⁵ Bridging IT; Lünendonk-Studie: Menschen Methoden Lösungen: Scalable Agility. Von der agile zur digitalen Transformation, 2019

projects there is no guarantee or best practice strategy to ensure success. General conditions and the environment also play a decisive role and accordingly, the project is flexibly adapted.

Due to the advancing technology and digitalization of both product development and production, companies are able to develop and launch new products extremely quickly. This fact also means that products must quickly become obsolete and be withdrawn from the market. For companies this means that they have to be able to adapt to these changes not only technologically but also organizationally.

Customer requirements should be fulfilled individually and for this reason the digitalization of the production processes is the only way to produce quickly and extreme efficient. So, with this opportunity customers requirement can be done in a high precision and in a precise quantity that was not realistic before.

The introductory question about the conceptual understanding of agile forms of work and organization shows how heterogenic companies define agile work practice. For a larger number of people, agile work practice generally represents the ability to react quickly and flexibly to unforeseen environment. Other people reference's mention the constant questioning of goals and the acceptance of uncertainties and the relevance of networked working.

The study GPM by "Deutsche Gesellschaft für Projektmanagement e.V." has figures in the study "Status Quo Agile", which is the third time was conducted. In the study in total over 600 people from over 20 countries took part. The new edition of the study examines how the use of agile methods is changing. Special emphasis is placed on the actual use, success and interaction with classic project management and the scaling of agile methods. Key results of the study on the dissemination and use of agile methods are the following. By using the agile methods 73% of the respondents see an increase in results and efficiency.

The agile method has a higher success rate than classic project management, but the success increases if the agile methods are used consistently¹⁹⁶. Only 4 years three quarters of the study participants have been using agile methods. However, only 20% of the participants use agile methods in their purest form.

¹⁹⁶ GPM Deutsche Gesellschaft für Projektmanagement e. V.: Studie „Status Quo Agile“, 2019

The university of applied sciences in Koblenz also came to the conclusion in its report that the use of agile approaches has led to an efficiency of 85%. Scrum remains the most used method with 84%¹⁹⁷. The most common and used method is scrum with 57%¹⁹⁸.

Agile methods are already common in many companies, but the corresponding agile mindset is often not yet anchored in the minds of the employees, management and in the organizational culture. This is the result of the "Future Organization Report" by the management consultancy Campana and Schott. They examined the opportunities and risks of agility from the perspective of top decision-makers, managers, and employees¹⁹⁹.

There are many reasons to be more agile. They range from the ability to react flexibly to customer requests, to a shortened market entry and improving the general effectiveness of the organization. Successful companies also see agile work practice as an opportunity to increase transparency in the company and to create an attractive development platform for employees.

While agile transformation often focuses on the teams, the methods and the processes, the new areas of competence and influence go quickly out of sight of the leadership. Additionally, agile transition depends on a competent team that accompanies the change from the beginning.

Some processes will have to be adjusted, including the infrastructure that is usually not available. But common challenges of a transformations are that there are always some areas that are not working agile as employees finding the agile ways of working unnecessary or limiting or because of responsibilities and of course often the main criteria is that just to work with a method without understanding it²⁰⁰. The "Agile Transition Team" needs to focus on successively addressing these issues in those areas. Solutions can often be found for very specific cases which then are often the "blueprint" for a change in working methods and

¹⁹⁷ Komus, A., Kuberg, M.: Status Quo Agile- Studie zu Verbreitung und Nutzen agiler Methoden. Eine empirische Untersuchung, Hochschule Koblenz University of Applied Sciences, 2017, pp. 1-34

¹⁹⁸ Komus, A., Kuberg, M.: Status Quo Agile- Studie zu Verbreitung und Nutzen agiler Methoden. Eine empirische Untersuchung, Hochschule Koblenz University of applied Sciences, 2017, pp. 1-34

¹⁹⁹ Campana and Schott and the Institute for Business Informatics at the University of St. Gallen: The Future Organization Report 2019

²⁰⁰ Sommer, A.: Agile Transformation at LEGO Group, Research Technology Management, 62 (5), 20, 2019, p. 25

processes within this company²⁰¹.

Big companies start big projects executed by large and distributed development, requiring agile methods for scaling. According to Dikert et al. scaling involves many challenging topics like lack of requirement analysis, challenges of the coordination of agile teams. These challenges are already known, and many large companies want to integrate and adopt the agile methods, in case to stay competitive and be more efficient. The scaling of agile methods to large-scale projects are missing in the large organizations and for this reason the successful integration of agile transformation is missing²⁰².

According to the survey, dealing with failures, which means addressing errors constructively and see the failures as a change for optimization and improvement is one of the core competencies in agile working environments. Agile change causes uncertainties with regards to possible restructuring and adaptation of fields of activity. An essential competence is the constructive handling of the various uncertainty factors.

In a continuous learning process, it requires openness to change, critical feedback and a variety of perspectives.

It is not only about methods and dealing with uncertainties it is more about to have an agile mindset. It is not easy and not effective to implement an agile project in a classical organization.

It is not that easy to do kind of a switch and overnight the mindset of people are changed and the behavior also. So, in general people need a long time to change their mindset. So, for this reason in the organization is can be difficult process what will need a long period of time. Changing methodologies in the middle of a project would cost more, need more resources and need a complete rescheduling of a project. So, the recommendation is to start with a plan and in this case plan the transition process. There should be an alignment and all involved employees should by fully agree with at least 80% acceptance. They should support development teams.

In the project management there are still using methods of classic management because of

²⁰¹ Gobble, M.: The Importance of Management Innovation, *Research-Technology Management*, 61 (6), 2018, p. 56

²⁰² Dikert, K., Paasivaara, M., Lassenius, C.: Challenges and success factors for large-scale Agile transformations: A systematic literature review. *The Journal of Systems and Software*, 119, 2016, pp. 87-108

the focus in recent years on knowledge and experience of waterfall methods and the way of working. So, the most people have worked with both methods: agile and classic way of project management. Classic methods are existing recent years and agile way of working is relatively young. So, in summary 60% of respondents are learning the classic and agile way to be flexible to the requirements on the market.

Lego Group is already in an agile transformation. But what are the reasons: Functionality of the digital deliveries and project delivery time could be significantly reduced. But the most important reason why the company's performance has improved is the changed employee motivation and satisfaction. The increased motivation could be achieved through internalized agile values and principles and not by mapping a model or method. Employees can be motivated by feedback and coaching²⁰³. Lego Group is a family-owned company established in 1932 and nowadays is successful in the world with manufacturing plants and shops.

The focus in the period of transformation was on openness for change. Employees are motivated to be open and to do changes for the benefit of the company and not to do routine tasks.

There are three stages:

1. Create strategy and vision. Employees and leaders develop together the change strategy.
2. Implement the plan. Employees are doing a plan and if he needs advice from a leader, leader can coach and support the employee.
3. Communicate and sustain change. In the early period of time employees should be involved in planned, top-down campaigns²⁰⁴.

The agile transformation of Lego was successful by using the three main steps above. They could establish product-oriented team structure with team motivation and continuous value delivery in sprints.

According to the study GPM (Deutsche Gesellschaft für Projektmanagement e.V.) the percentage of employees is decreasing who do not use any agile approaches at all and work in

²⁰³ Sommer, A.: Agile Transformation at LEGO Group, *Research Technology Management*, 62 (5), 2019, p. 22

²⁰⁴ CEB Global: Making Change Management Work. White Paper, 2016, pp.1-12, Source: <https://www.cebglobal.com/content/dam/cebglobal/us/EN/best-practices-decision-support/human-resources/pdfs/making-change-management-work-whitepaper1.pdf> accessed 12. September 2020

a classical way throughout. Here, the proportion has fallen from 2012 (22 %) to 2019 (8 %), which indicates that agile approaches have been widely accepted in practice.

In 2019, the proportion of hybrid users is significantly higher than in the previous studies. The proportion of hybrid users has increased from 27% in 2012 to 43% in 2019. The proportion of consistently agile users has remained relatively constant over the years. The proportion of selective users has decreased slightly compared to 2016 (31% to 28%).

Scrum has the greatest general importance of all approaches. 55% of the agile participants rated the approach as very important and 29% as important for their area, only about 14% as unimportant or of little importance²⁰⁵.

The fact that the corporate culture is not change-oriented is most frequently stated by those questioned from the consistently classical area. No significant differences are discernible between the hybrid and the consistently agile participants. 28 % state that change is a component of the corporate culture. 37 % of those surveyed stated that individual departments see change as an integral part of the corporate culture. 28 % describe the corporate culture of their company as having changed little. Only 4 % do not see a change-oriented corporate culture in their company²⁰⁶.

In discussions with product development managers show that the status of implementation and, above all, the practical application of agile methods are very different. Before the introduction of agile the framework and the objectives should therefore be clarified in any case. This means not only a change in the way of working but also a change in roles and responsibilities within the development process²⁰⁷.

The goal was to apply the agile methods to the entire product development and not only to the subareas. After a comprehensive analysis it turned out that the project team had to experience the biggest changes. Because the way of working and also the framework of responsibility change need to be redefined. The fact that the members of the team support

²⁰⁵ GPM (Deutsche Gesellschaft für Projektmanagement e.V.): Studie 2019

²⁰⁶ Hernstein Management Report: Führungs- und Wertekultur in Unternehmen 1 Bericht, 2018, pp.1-15

²⁰⁷ Schröder, A.: Agile Produktentwicklung. Schneller zur Innovation – erfolgreicher am Markt. 2 überabrt. Auflage, Carl Hanser Verlag München, 2018, p. 205

each other and also take on new tasks means that there is more methodological competence²⁰⁸.

With agile methods the question arises whether the agile projects should be carried out independently or carried out by specialists in the form of an external consulting company.

Ideally it should be the selected pilot projects. As with any major project management is the key driver that creates the necessary framework and accompanies the change process.

The "Future of Organization" study is based on surveys of around 1.100 executives and non-executives from ten industries in over 40 countries. In addition to statistical information on the type of company and economic success, changes in the organization, design options and success factors were also queried²⁰⁹.

This was followed by an analysis of the success factors mentioned and their influence on the economic performance of a company. The study defines those companies as successful or as "top performers" who achieve an above-average profit margin compared to the competition and who grow faster than the competition.

There are 73% of questioned people that are given great importance to the agile way of working. They define agile under flexible adaptability of a company, but around half of the companies describe themselves as not sufficiently agile.

The study presents the direct connection between agile work practice and success: Agile companies achieve above-average margins up to five times more often and grow faster than their competitors. Over 40 % of all agile companies are top performers, only 24 % develop below average.

The most important finding from the study: companies in Germany are already working with agile methods such as "Scrum" or "Kanban".

If a company is working with the agile way of working, it does not mean at the same time the agile mindset is also existing. The minds of employees are not anchored in the corporate and the agile mindset is not integrated in a corporate culture. In this way, agile structures

²⁰⁸ Schröder, A.: Agile Produktentwicklung. Schneller zur Innovation – erfolgreicher am Markt. 2 überabrt. Auflage, Carl Hanser Verlag München, 2018, p. 209

²⁰⁹ Roghé, F., Scholz, S, Schudey, A.: Organisation im 21. Jahrhundert. Eine Studie identifiziert sechs Erfolgsfaktoren, Zeitschrift Führung und Organisation. www.wiso-net.de. 86 (4),2017, p. 244-249

and approaches are predominantly introduced in certain areas. The topic of sustainability is important, but a long-term roadmap is not existing or maybe existing selectively. The planned goal of agile culture is not really realistic.

The agile concept was introduced as an agile manufacturing in 1991. The aim was to establish an adaptive work process to quickly adapt to changing market conditions²¹⁰. It is clear to employees that new skills are necessary for agile working methods. 81.2 % of those surveyed feel that they are equipped for their current tasks. At the same time, however, 75.4 % see the further development of new skills as essential.

Teamwork plays an important role in an agile context. A third of those surveyed are convinced that working in a team will be more successful (30.5%). For 48.5 %, the most important thing is the necessary coordination.

To underpin the hypothesis of this work it is essential to mention in this study the statement that the executives lead as a role model in the context of agile transformation. The focus is on collaboration, communication and decision making at eye level, regardless of the hierarchical role.

In fact, managers in many agile companies are already acting in an agile way and give up responsibility. A third of the respondents (33.5 %) say that their manager enables them to cope with their agile tasks. Almost two thirds of the participants are motivated to take the initiative (65.7 %), are given powers (64.6 %) and have a positive outlook for the future (60.9 %) and can organize their work independently (60.2 %). Managers rate themselves as much more agile (50.3 %) than employees (25.1 %).

Only every fifth participant (19.2 %) says that mistakes in the company are not used against the person so this factor can be an obstacle of an agile transformation. The main reasons are the fear of mistakes and a lack of communication.

Agility does not have to be measured using one's own Key Performance Indicators (KPIs) but rather serves to achieve other goals more efficiently, the authors of the study write. However, a review and adjustment of the previous KPIs is necessary because agile organizations create different framework conditions. So, companies do not have a strategy and a roadmap,

²¹⁰ Karabulut, A. T., Ergun, E.: A new way of Management: A Scrum Management, 4 (2), 2018, p. 108

intermediate goals or desired results. The transparency and traceability are challenges of the agile transformation.

According to ACE, a survey of around 500 top managers from Europe showed that almost everyone regards agility as a differentiating and critical success factor and that the majority want to significantly increase the agility of their companies. The study also showed that agile companies are more innovative and set the pace in their industry²¹¹.

Leadership, culture, and competence development are essential, still often neglected levers for successful transformation. 34 % of users of agile methods rate their company more successfully than other companies and 70 % of the organization have their efficiency improvements through the application of agile methods²¹².

Leaders make a particular contribution to the degree of agility of a company, as they shape the prevailing behaviors and thus the company's culture. In order to promote agile processes and surface for the successful development from a classic to an agile organization, an employee-centered understanding of leadership is essential. Leaders make a particular contribution to the degree of agility of a company, as they shape the prevailing behavior and thus the corporate culture. In order to promote development of agile processes from a classic to an agile organization, an employee-centered understanding of leadership is essential.

The introduction of the agile approach and the agile methods demands increasing responsibility and decision-making competence from the employees. In contrast to classic companies, in which responsibility is taken over by a disciplinary manager, in the agile organization this is equally transferred to the employees.

2.3 Influence of leadership type on agile transformation

Leadership takes place in a framework that includes clear, uniform processes and procedures, quality standards and the greatest possible efficiency. Even if agile work practice

²¹¹ ACE – Allied Consultants Europe: Unternehmensagilität: Die neue Normalität. Wie Sie die Agilität Ihres Unternehmens messen und verbessern können, 2016, pp. 4-24

²¹² Weckmüller, H.: Agilität kommt langsam voran. Agilitätsbarometer 2017. Personalmagazin, 09, 2017, p. 10-15

focuses on people, associated management tools or fixed processes in the team are still considered important by also adapting them²¹³.

It is a fallacy that with the rearrangement of responsibility areas what changes with agile approach is that a manager is less needed or loses status in the enterprise. Only a focus shift takes place as managers capacities are used differently. The leadership continues to play a key role²¹⁴. The leadership provides advisory and coordination support to the team in decision-making and supports the solution finding process.

Agile personnel management creates a working environment that combines a stable functional basis with pronounced dynamic components, which gives employees both orientation and freedom²¹⁵. Even in agile organizations and times of self-organization, executives are still needed to make decisions, show the way forward and guide them.

In any case, transparent communication is essential to give employees security in dealing with agile work approach²¹⁶. Typical fears and resistances of employees in the agile change process are the following:

- Lack of transparency about the change process.
- The goal and therefore the added value are not understandable.
- Lack of trust in the leader.
- Change process and the project must be made public.

Managerial expertise is not enough for the implementation of agile management. Above all, coaching skills, social competences, and a systemic approach are required²¹⁷. The expectations towards an agile leader lie increasingly in the conveyance of values as well as in the development of employees to support them in their self-development into professional experts and their self-identification as professional experts in their area of responsibility.

According to the study "Successful Leadership in the Agile World", it is not only a matter

²¹³ Appelo, J.: Management 3.0. Leading Agile developers, developing Agile leaders. Upper Saddle River: Addison-Wesley, 2011, p.24

²¹⁴ Appelo, J.: Management 3.0. Leading Agile developers, developing Agile leaders. Upper Saddle River: Addison-Wesley, 2011, p. 109

²¹⁵ Anderson, K., Uhlig, J.: Das agile Unternehmen. Wie Organisationen sich neu erfinden. Frankfurt a. M.: Campus, 2015, p. 277

²¹⁶ Ramsauer, C., Kayser, D., Schmitz, C.: Erfolgsfaktor Agilität. Chancen für Unternehmen in einem volatilen Marktumfeld. Weinheim: Wiley, 2017, pp.267

²¹⁷ Scheller, T.: Agile Personenauswahl. Erfolgreiche Vorstellungsgespräche im Kontext von Innovation und Vielfalt. Freiburg: Haufe, 2017, p. 388

of introducing agile development methods or structural changes, but rather - as with all far-reaching organizational changes - cultural change or the examination of the existing corporate culture is of decisive importance. This report covers the most frequently mentioned topics from 58 IT and management experts from five different organizations, all of which have already introduced agile approaches. This report indicates that leadership is a successful use of agile. The promotion of a trusting management culture, a high degree of employee and team orientation, transparency, openness, and continuous learning are desirable²¹⁸.

The manager creates the framework for agile working, sets goals for orientation and accompanies the employees in their achievement. The manager therefore has a supporting, controlling and shaping function²¹⁹.

According to the study "Leadership in Transition" was conducted with 36 questions 466 experts and managers from various sectors and companies. However, the most frequent responses with 46% show that the route via the internal network is used and relies on the support of other influencers, either in a supportive way with 32% or in a destructive way with 8%. The results confirm the leadership room model of the academy for business leaders that a fluid and flexible network of relationships and informal communication spans the (hierarchical) organizational structure at the same time. Power and influence in these networks do not come about through the hierarchical position or formal power that someone occupies, but rather through the quality and quantity of their networking. The more relationships a person maintains within the network, the greater his or her effectiveness in it. This is because only 22% of top management and executives exemplify an agile approach.

For the upper management, however, the assessments of the study participants are no longer so positive. The values for a consistently high commitment to the agile mindset are only 12%. The middle management has a significantly stronger agile mindset than the upper management, with 21% agreeing. According to the study participants, many managers find it difficult to mentally adapt to agile topics, to hand over responsibility and to have no or only

²¹⁸ Kalteneckers, S., Spielhofer, T., Eybl, S.: Erfolgreiche Führung in der Agilen Welt. In: Eine Studie der Plattform for Management (www.p-a-m.org), Institut für systematische Organisationsforschung, 12, 2011, pp. 27-36

²¹⁹ Hofert, S.: Agiler Führen. Einfache Maßnahmen für bessere Teamarbeit, mehr Leistung und höhere Kreativität- Wiesbaden: Springer Gabler 2016, p.115

limited authority and control as product owners²²⁰.

These results illustrate very well that agile transformation does not only refer to the introduction of new methods. Rather, it represents a complete change of the previous structures and mindset as well as a strengthening of individuality. The problem of many managers, however, is that on the one hand they are responsible for the day-to-day business and on the other hand they are supposed to integrate themselves into agile teams - and there they rather play the role of a coach or sparring partner.

The overarching goal of agility is the goal-oriented work of all organization members with its greatest benefit for the company, what in an unsecure economical context goes along with flexible and adaptive working style. Furthermore, the manager commits towards his team to jointly work on efficiency, achieving results and being prepared for future developments²²¹. Managers, therefore, combine added value and appreciation. The perseverance of managers is required as the new mindset takes time. Especially at the beginning of a change process, it can be unsatisfactory not being able to predict within what time frame and to what extent success will be visible.

A change in this sense from classic to the agile is not always recognized positively by leaders. Resistance and fears accompany the change process at all hierarchical levels. Fears and resistances must be addressed as they are part of the change process to the new role. For the turnover towards an agile mindset, employees must be picked up to participate in the agile change process. A successful change process requires transparent communication. A leader leads employees in an agile context not by giving instructions, but by culture and vision, which are being conveyed and exemplified.

Trust is an important factor that not only creates a pleasant atmosphere in the workplace, but also reduces costs within a company. Such a company is more effective than companies where trust is lacking. Trust is the prerequisite, but it is even more important for a work purpose and its added value. This is also the key to success, as the organization has values

²²⁰ Akademie-Studien: Führung im Umbruch. Die Akademie für Führungskräfte. Leibnitz-Informationszentrum Wirtschaft, 2016, pp. 6-26, Source: <https://www.econstor.eu/handle/10419/230536> accessed 27.September 2021

²²¹ Häusling, A.: Agile Organisationen. Transformationen erfolgreich gestalten. Beispiele agiler Pioniere. Freiburg: Haufe, 2018

and norms that allow people to work effectively together. This common belief and value system in turn increases trust as people involved can trust others in negotiations²²².

According to the study "Successful leadership in the agile world", the professionalism of change management is related to the quality of communication. Intensity, speed, directness and openness as well as structural safeguards. These are the most frequently mentioned criteria for agile leadership. The entire system - the entire organization - is responsible for the performance, not only the leadership though²²³.

For many people it is self-evident that they tend to strive for self-organized and self-determined work, but not every employee is interested in self-organized work and decision-making autonomy. As a result, some employees feel overwhelmed with new and diverse tasks, autonomy, a high degree of independence and personal responsibility. For this reason, employees might hinder implementation and experience the required flexibility as a stress factor²²⁴.

In this sense, the qualities of the leaders are needed in what kind of way to deal with the changes. The change process is complex, and the top management is often not handling properly consistently enough with the agile way of working and thinking.

Top management don't recognize the big influence on the company of the topic of agile work approach. The top management defines the internal leadership understanding and sets the direction²²⁵.

In the following table summarized listed points what can hinder the transformation process:

Table 4: Barriers of employees and leadership that hinder Agile Transformation

Company	Barriers
Employees	<ul style="list-style-type: none"> • Absence of change willingness • No recognition of agile values • Lack of professional understanding

²²² Gloger, B.: Scrum Think Big Scrum für wirklich große Projekte, viele Teams und viele Kulturen. Carl Hanser Verlag München, 2017, p.192

²²³ Kalteneckers, S., Spielhofer, T., Eybl, S.: Erfolgreiche Führung in der Agile Welt. In: Eine Studie der Plattform for Management (www.p-a-m.org), Institut für systematische Organisationsforschung, 12, 2011, pp. 27-36

²²⁴ Appelo, J.: Management 3.0. Leading Agile developers, developing Agile leaders. Upper Saddle River: Addison-Wesley, 2011, p.125

²²⁵ Ramsauer, C., Kayser, D., Schmitz, C.: Erfolgsfaktor Agilität. Chancen für Unternehmen in einem volatilen Marktumfeld. Weinheim: Wiley, 2017, p. 8

	<ul style="list-style-type: none"> • Absent goals and visions • Overstrain from growing responsibility • Insecurity
Leadership	<ul style="list-style-type: none"> • Lacking understanding for agile values • Lacking openness for new tasks • Refusal to give up power and control • Overstrain from operational tasks

Source: Author`s creation

Employees and leaders have different perspectives that hinder agile transformation. It is becoming clearer that the leaders lack openness and trust, and that the employees are more concerned with the orientation and by absent of goals not willing to changes.

According to the “Future Organization Report_2019” of managers in agile companies already delegate a lot of responsibility and create free space. The study was joined 449 leaders and employees from companies that are working in the agile context. In addition, the findings from interviews with 21 top decision-makers have been incorporated into the results. A third of those surveyed with 33,5 % say that their managers empower them. In other words, they are motivated to take the initiative with 67% and are given more authority 64% as well as a positive outlook for the future with 61%²²⁶.

In summary there are obstacles in the process to agile transformation. The studies show that only every fifth participant with 19% says that mistakes in the company are not used against the person. Only 35,5% percent are feeling comfortable by taking a risk in a company and only 14 % of employees feel comfortable by asking colleagues for support or help. So, it is in the hand of a leadership to develop a tolerant failure culture. Employees have to trust to a positive meaning of a failure and see it as a change to improve the process or the work. So, in this case the leadership should motivate employees to do so. This is a basic requirement for agile organizations and leads to a decision-making skill among employees²²⁷.

Through complex IT solutions and connections, a new working model is emerging, which is increasingly oriented on processes. Justified by the high complexity, almost no one is a full expert in a thematic field. With the rising specializations, the number of differentiated activities is rising, and the leadership role is changing. The shift is being made from a control

²²⁶ Campana-Schott and Institut für Wirtschaftsinformatik der Universität St. Gallen: Future Organization Report-2019, pp.10-25

²²⁷ Campana-Schott and Institut für Wirtschaftsinformatik der Universität St. Gallen: Future Organization Report-2019, pp. 15-25

function to a coaching and supportive one to serve as samples for the highly qualified staff members.

However, not only leaders undergo the transformation and form a decisive factor for the change, but also the culture needs to be reassessed and newly defined. The organizational culture can be influenced by the management and is, therefore, a management task. The particular contribution is required in the form of perceptions and behavior patterns towards innovations or new ways of working²²⁸.

An organizational culture supporting the innovative behavior of its employees is considered as one of the most important competition factors for all innovative companies. Such an organizational culture supports a positive attitude towards changes and the contribution and realization of new ideas²²⁹. The implementation is proceeded by the leadership as the leader is considered to be the decisive driver²³⁰.

Since mid-september 2012, the project "Forum Good Leadership" has been dealing with these questions. Both managers and employees are confronted with a dynamically networking world of work that demands a high degree of self-direction and cooperation. The aim of the survey was to make the implicit knowledge of managers visible and to show which value patterns influence their leadership actions.

Five leadership behaviors emerge from the study:

1. 13.50% follows the traditional safeguarding care based on the ability to provide security to employees. Here, the satisfaction of the employees is the result of personal role model function and assumption of responsibility.
2. 29.25% manage by the numbers of collaboration towards the goal of strategy implementation and profit and measuring this against KPIs.
3. 15.50% value solidarity-based stakeholder action. Here, freedom is offered, and the primary goal is to consider the interests of all.

²²⁸ Gobble, M.: The Importance of Management Innovation, *Research-Technology Management*, 61 (6), 2018, p. 56

²²⁹ Johne, F. A., Snelson, P. A.: Success Factors in Product Innovation: A Selective Review of the Literature. *Journal of Product Innovation Management*, 5, 1988, p. 124

²³⁰ Dikert, K., Paasivaara, M., Lassenius, C.: Challenges and success factors for large-scale agile transformations: A systematic literature review, *Journal of Systems and Software*, 119, 2016, pp. 87–108

4. 24% "simulation of network dynamics". This is about horizontal networking between all actors in the company. This is primarily about self-organization.
5. 17.75% coaching cooperative teamwork - A good leader supports and guides cooperation in decentral organized teams that flexibly adapt to different tasks²³¹.

It is clear that good leadership type is not about profit, but about creativity and self-reliance, so the trend goes more towards identity building, team coaching and empowerment. Network-based and self-organized employees with a need for coaching are emerging.

Shaping and implementing the agile transformations requires a highly qualified and motivated working force, which generates new proposals through a continuous exchange. The engaged behavior of leaders as well as of teams have, therefore, a decisive success influence. For this reason, companies try to create an attractive environment, which stimulates openness towards an agile working style moving apart from the ordinary methods and tasks fulfillment.

In summary it is possible to make a statement that the companies are on the path to agile transformation, in the sense that they are in a transition process. The projects in companies are increasingly being handled with agile methods, for this reason, they are faster to introduce innovative products, for example. The advantages of an agile way of working have been already recognized, but the agile approach is generally not yet or only partially part of the corporate culture. For this reason, leadership especially a right leadership type is an important part of this agile transformation process.

²³¹ Bundesministerium für Arbeit und Soziales: Minotor Führungskultur im Wandel. Kulturstudie mit 400 Tiefeninterviews. Forum Gute Führung. Ein Angebot der Initiative Neue Qualität der Arbeit. 2019, pp. 4-22

3 EMPIRICAL EVALUATION OF THE IMPACT OF LEADERSHIP TYPE AND AGILE WORK PRACTICE IN A PROCESS OF AGILE TRANSFORMATION

This chapter contains the research carried out in order to evaluate the impact of leadership type in agile transformation. Primary research, both qualitative and quantitative has been described.

3.1 Development of research dependency model between leadership type, agile work practice and agile transformation

This aim of the present dissertation is to investigate the dependency of leadership type especially the leadership behavior and the process of agile transformation. The existing lifecycle of products is shortening and based on customer requirements also changed. Companies have to act flexibly just to stay afloat. This recent development is caused by an increasing cost pressure and increasing need to act faster, smarter, and still keep the best quality.

Qualitative and quantitative approaches are complementary in their relationship because they are each particularly suitable for research into different areas. These two approaches were used in this thesis. The main aim was to investigate the dependence of the two variables: leadership type and agile transformation.

The methodological strategy mediates between causes and effects - causal mechanisms are sought²³². Attributes such as quantitative, nomothetic-deductive or theory proved refer to this in connection with research strategies that focus primarily on the aspect of the causal relationship and whose focus is on standardized data collection and the application of statis

To develop a research dependency model, the first step is to identify one area in enterprises which has influence on the elements of agile work practice and therefore on agile transformation. This thesis focuses on leadership type and more specifically to whether the involved leaders have an influence on agile work practice and agile transformation and if agile work practice have a correlation to agile transformation. For this thesis research, the example of a huge manufacturing enterprises with over 48000 employees are used.

²³² Gläser, J., Laudel, G.: Experteninterviews und qualitative Inhaltsanalyse (4. Aufl.). Wiesbaden: VS Verlag für Sozialwissenschaften., 2010, pp.25

Consequently, this research aims to answer the question whether there is a relation between involving leaders and agile work practice in the process and progress of agile transformation. In doing so, it addresses various elements that can help enterprises to adjust there the processes and to improve the strategy in the agile transformation and increase their economic performance.

For this reason, the following dependency model was created in this thesis.

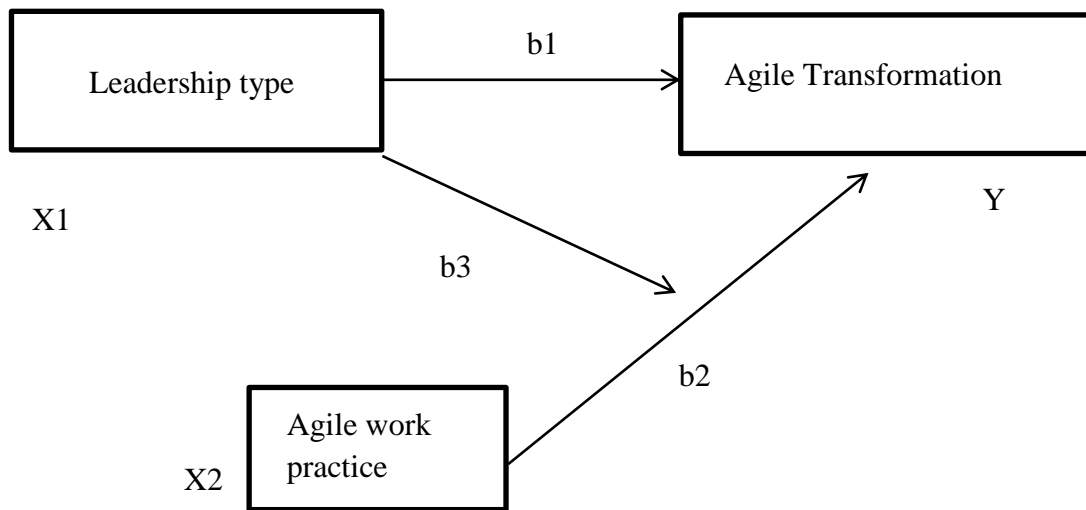


Figure 13: Dependency model between leadership type, agile work practice and agile transformation

Source: Author's illustration

The illustration below shows the underlying research dependency model:

X1: leadership type, X2: agile work practice and Y: agile transformation; this is the main version of the final research dependency model. All variables are defined to make them measurable.

At the first step b1 means, that there is a correlation from leadership type to agile transformation. At the second step b2 means that there is a correlation between agile work practice and agile transformation. And at the third step b3 means that leadership type has influence on the correlation between agile work practice and agile transformation. In this chapter the research dependency model in correlation with the hypothesis testing will be described and checked.

Main hypothesis and thesis for defense

Main hypothesis:

Consideration of a leader predominantly as a coach and agile work practice influences the agile transformation in companies.

Theses to be defended:

1. Leadership type, agile work practice and agile transformation can be defined and measured by characteristics.
2. Leader predominantly as a coach fits the agile transformation.
3. A clear relationship between agile work practice and agile transformation exists.
4. One leadership type has influence on the relationship between agile work practice and agile transformation.

Three processes can be followed: in this thesis the first step has been the analysis of the literature review. The second step has been the preferred semi-structured specialist interview²³³.

The interviews are carried out in the framework of qualitative social research and are concerned with the logic of discovery. This involves the generation of hypotheses and also the object-related theories in the research process. Thus, hypotheses can be postponed at the beginning of the survey. This leads to demands for openness of the procedure. Finally, the quantitative approach with a questionnaire for 111 employees has been applied as well.

By testing a theory deductive approach is used in this thesis und the aim is to falsify or verify a theory by a hypothesis. It is based on quantitative research and at the beginning by collecting data²³⁴. So, for this reason there are basically two research approaches what was used in this thesis: Correlative and experimental studies²³⁵. Based on it a questionnaire was developed. In this case the research design is the basis of any scientific investigation in fields of work.

²³³ Rosenthal, G.: Interpretative Sozialforschung. Eine Einführung. 5., aktualisierte und ergänzte Auflage. Weinheim, Basel: Beltz Juventa (Grundlagentexte Soziologie), 2015, pp.13

²³⁴ Saunders, M.; Lewis, P., Thornhill, A.: Research Methods for Business Students. Pearson Education Limited, 5th Ed, 2009, p. 146

²³⁵ Creswell, J. W.: Research design: Qualitative, quantitative, and mixed methods approach. Los Angeles: Sage, 2009

3.2 Mixed methods research

In order to test the hypothesis, the mixed-method approach of qualitative and quantitative research was chosen to evaluate the data. In order to test the hypotheses, they should be operationalized, i.e., should be translated into measurable or observable units or answerable questions²³⁶.

A multi-methodical field approach that combines quantitative and qualitative approaches opens up opportunities to investigate a research subject and thus research questions from different perspectives. At the same time, the application of mixed methods raises new questions and challenges for research practice, which affect both the methodology and the methodological approach, such as demands on the research design or the relevance and temporal location of the mixing of research findings.

The author of this thesis is following the structure:



Figure 14: Rough procedure of the empirical research

Source: Author`s illustration

At the first step the main task is to formulate a hypothesis. Then it is crucial after the literature research to select a research way. It is important to survey people that are matching to the hypothesis and the research way. After getting data from employees in a company the evaluation can be started and after this step it is possible to test the hypothesis.

²³⁶ Flick, U.: Sozialforschung. Methoden und Anwendungen; ein Überblick für die BA-Studiengänge. Originalausgabe. Rororo Rowohlt's Enzyklopädie, 55702, 2009, pp. 234

In the systematic evaluation of data there is a differentiation of quantitative and qualitative evaluation. Both forms have in common that the data material is related to central points of view by counting frequencies and forming characteristic values²³⁷.

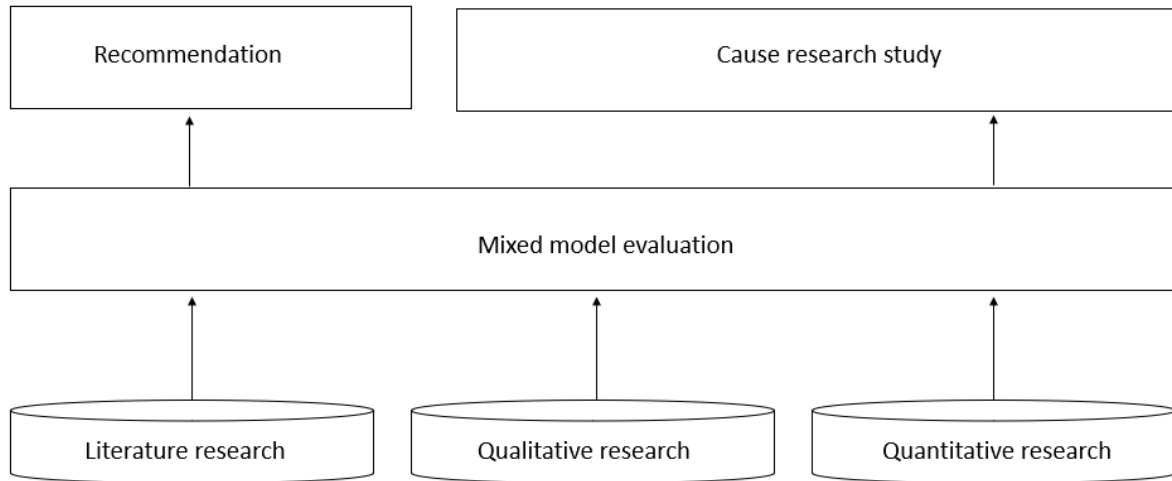


Figure 15: The coherences of the main thesis blocks

Source: Author's illustration

The illustration shows that the basis for the dissertation is laid with the help of an exploratory sector-specific survey, an exploratory survey, quantitative survey, and the evaluation and definition of the parameters for measuring the variables. It is happening by interviewing and with the support of operational and scientific specialists.

The aim of mixed model research is not to decide for only one way or replace the research (quantitative or qualitative) approaches but also from strengths and minimize the weaknesses of both. Throughout the last decade, the mixed methods approach has been included more and more into the discussion about research paradigms.

The topic of a leadership in the process of agile transformation is complex and therefore, a mixed approach with qualitative and quantitative approaches is the best way to get more possible insights.

The research strategy helps to define the leadership type, agile work practice and to determine what kind of definition should be considered in the questionnaire and on what kind of

²³⁷ Moser, H.: Instrumentenkoffer für die Praxisforschung. Eine Einführung. 5. Aufl. Freiburg im Breisgau: Lambertus, 2012, p. 105

criteria to measure the agile transformation in an efficient way. This will allow to study the leadership style.

The research strategy shall help to determine which stakeholders have to be involved to increase success in decision processes.

In the qualitative research there were five specialists interviewed. The specialists were interviewed in semi-structured interviews via phone. The aim of the semi-structured interviews was to define in a measurable way the leadership type, agile work practice and agile transformation.

Derived from literature research and research of specialist interviews a research dependency model was developed.

The following illustration shows the framework of the quantitative research, including the most important key data of the quantitative approach:

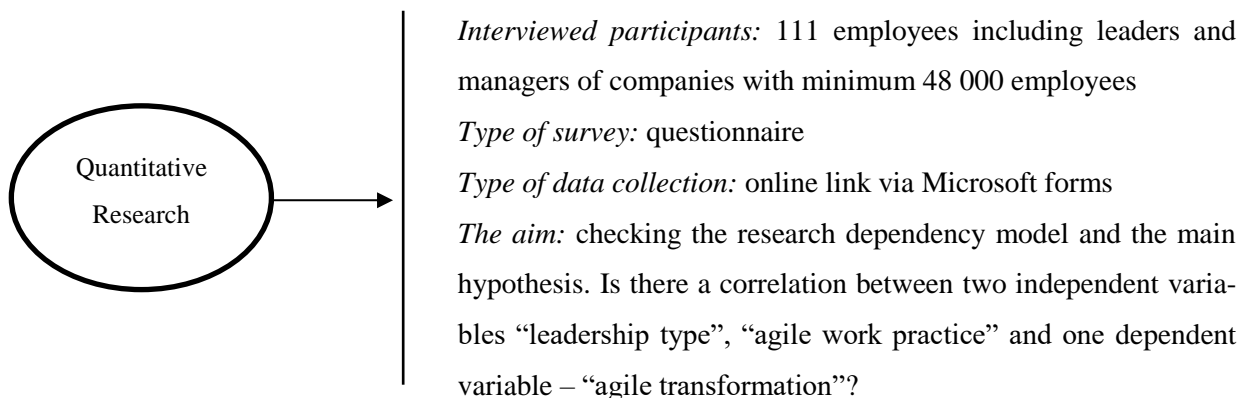


Figure 16: The procedure framework of quantitative approach.

Source: Authors illustration

3.3 Specialist interviews on definition of agile transformation and research dependency model

The aim of the survey is to identify and obtain key values of the results from the individual interviews. In addition, the results will be analyzed against the background of already existing findings from the literature. In the course of the research and the interviews, the interview guidelines were adapted in the light of advancing knowledge.

The main respondents are employees in companies that are working in leading positions in projects or in their departments and have previously had experience with agile principles. These are project managers or employees in leading positions in different departments like purchase, sale, finance, manufacturing, operations, and RD.

Besides this the selected group has already had experience in the agile project management, in the agile working in their responsible processes or they are project leaders for the implementation of agile mindset and agile methods. But for the qualitative research it is important to select a group of specialists that have in-depth experience and knowledge in handling and steering of an agile approach.

The interviews were conducted very intensively during July 2020. The interviews lasted between 100-120 minutes on average.

Semi-structured specialist interviews

Interviews can be conducted openly, semi-structured or structured. Open interviews begin with an introductory question, to which the interviewee comments without further major intervention by the interviewer. They are mainly used in psychological environments. Structured interviews are based on a catalogue of open and closed questions, the order of which is fixed. This form of interview thus corresponds to the use of a questionnaire in a conversation.

Semi-structured interviews have been conducted using a guideline and are therefore also called guideline-based interviews. The interviewee is considered to be a specialist in a special field. This is the synonym for specialist interviews for semi-structured interviews.

These enable two things:

1. On the basis of an interview guideline the interviewer can control topics and procedure.
2. The interviewee can speak freely. This gives freedom to describe problems and ideas for solutions. Above all, there is freedom for aspects that the interviewer has not seen before, i.e., for new insights.

So, what is a definition of it in this thesis:

- To be a specialist, the interviewee must have substantial knowledge of the processes in project management, especially in agile project management and agile implementation in the company.
- To be a specialist, the interviewing person must have decision making power within the role.
- To be considered as a specialist, the relevant work experience must be more than 10 Years.
- To be considered as a specialist agile way of working should be a big part of the daily work.

So only in case of fulfillment of the criteria below the interview can be started and done. In the following table describes the interviewed leaders from three big companies:

Table 5: List of interviewed specialists in companies

Specialist No.	Profession	Working experience	Company
1	Leader Manufacturing Factory	25 yrs	Siemens
2	Manager Business Excellence	11 yrs	Siemens
3	Senior Manager Consulting	16 yrs	Audi
4	Head of Manufacturing Technology Excellence	29 yrs	Audi
5	Head of Strategy	18 yrs	Liebherr

Source: Author`s creation based on executed interviews

In today's world the term agile is widely used and the importance of an agile transformation is already acknowledged in companies. The definition is a key to measure if and how to define the important criteria. The criteria should be measurable otherwise it is not possible to measure and to propose a suggestion.

Explicitly in the interviews the specialists were asked what they understand under leadership type, agile work practice and agile transformation.

After evaluating the interview results and considering the literature research, the following statements can be made:

Leadership type in context of company culture according to the literature research is in this sense an inward-looking mission of leading companies. According to the statements from the specialist interviews, leadership is in the first step directed inwards and in the second

step involves a leadership role between people and companies.

There are a total of three criteria by which leadership in the company can be measured:

- Qualities necessary to be a leader.
- The relationship between leaders and those they lead is important. Here, the embedding of leadership in the companies' culture is crucial.
- Leadership is understood as a process that does not have to be linked to individual persons with fixed role assignments.

Thus, according to the specialists, leadership also takes place in contexts in which hierarchies are not defined in advance, but responsibility for the success of the project or for several tasks in the company are constantly readjusted in the process.

In the literature research, certain leadership types have been detected, which are even heterogeneous in themselves. At this point, the leadership types from the literature research are taken up, which have also emerged after analyzing the results of the interviews.

The authoritarian type of leadership is still present in companies. In the authoritarian leadership type, the manager always makes the decisions alone and only informs the employees. Especially in the case of strategic decisions or global strategic projects, the decision is made in this way. This style is particularly appropriate in crisis or emergency situations, as in such situations quick decisions are usually necessary.

Due to the increasing complexity, companies are dependent on experts in different fields, and it is becoming more and more difficult to bundle the knowledge in one person. Therefore, the leadership type "leader as a coach" is increasingly in demand in companies. This type of leadership is found more at the operational level.

The leader makes agreements with the entire team and makes sure that the decisions are adhered to by all. However, this also means that the manager confronts the employees with problems if necessary and develops solutions together with them. It is important that the leader always remains predictable and equally accessible to all, as someone who clearly sets the course and makes cooperative agreements with all employees within the given framework. In case of difficulties, the leader tries to help or to support the team in the best possible way.

With regard to the agile way of working, the interviewees come to the following point. The

agile way of working continues to be promoted and the “servant leader” type of leadership is becoming more and more prevalent. In order to achieve the best possible creativity of the employees, it makes sense to let the employee work. Especially, this type of leadership is required for innovation.

However, this type of leadership is more common in start-ups and in theory large companies can imagine having such a type of leadership, but in practice it is not achievable with the existing rigid organization of the companies.

Based on statements of specialist interviews and literature research the measurable factors for leadership type can be worked out. According to specialist interviews there are the following three leadership types:

- Leader as a coach → Leader who supports a team and act like a trainer or a coach is common.
- Leader as a servant → Leader who serves his employees or leaders has appeared as a result of agile working.
- Autocratic leader → Leader who behaves opposite of a coach. The behavior and the mindset of a leader who decides and controls is still common in organizations.

After the specialist interview the following matrix arises:

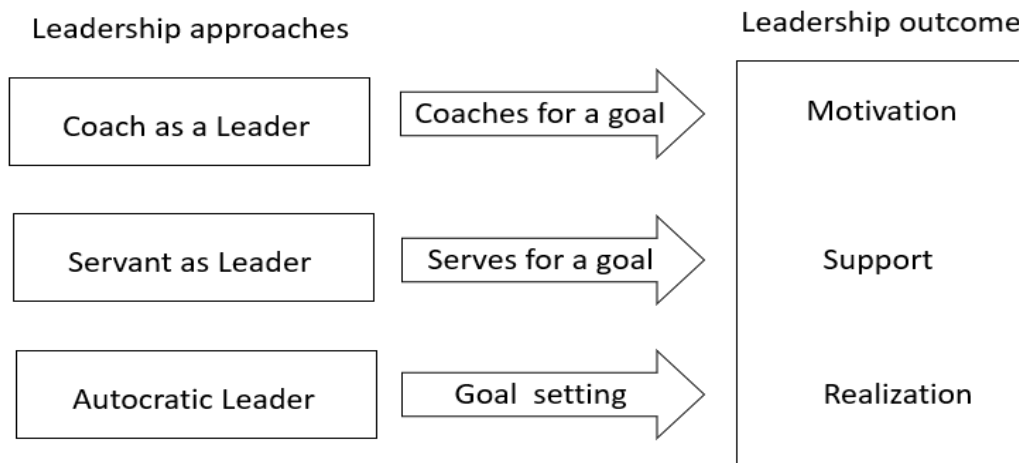


Figure 17: Leadership matrix developed after specialist interview evaluation

Source: Author`s illustration

In the illustration above three leadership types and their motivation/initiation to act have been presented. Each of them wants to achieve a goal but the approach is different and based

on their chosen approach also the outcome for fulfilling a goal is different.

Agile work practice is a modern term and has been described in the theoretical part of this thesis. The specialists have also asked what they understand under agile work practice according to their perception and in companies. If the theoretical research and the results can be combined, the main understanding about agile work practice arises. At the first step agile work practice means agile methods that can be implemented and with agile project management. In this case agile work practice is tangible and measurable.

Based on this results and literature research following factors are arising to measure agile work practice:

- Agile methods.
- Agile project management.

The term agile transformation has different definitions, and in every company, the agile transformation can be also realized and implemented differently. So, there is no unique general rule to achieve a successful transformation.

Agile transformation includes some individual company points that are specific to the company. As already described in the theoretical part, there are chances have been identified that are not entirely transparent and cannot be copied. The specialist interviews pointed out challenges on the way to agile transformation. Without the following points agile transformation can't be fulfilled.

1. Especially the top management in companies are focused on realizing the strategy, new ideas and their KPIs and assume that employees know how to work. In this case, many people in the company talk about the agile approach, but do not really understand the principle and methodology behind it. At this point, the methods of the employees are not really known or only to a certain extent.
2. The product-oriented agile way of working requires a new division of teams and responsibilities for existing projects. Not everyone is convinced of team spirit and self-organization and self-responsibility. There are still employees who want to pursue their goals and increase their status or even their power and even not interested on collaboration.

3. Change is not always perceived positively, because it may mean a shift in tasks and power relations. Staff members individually feel that they cannot influence change in such a large organization. Also, lack of transparency and ignorance about the new approaches and concepts can strongly influence the willingness to change. If the willingness is not there, it is almost impossible to implement anything.
4. There is no time or support from leaders to establish and work out agile values as a long-term mission. Leaders are focusing more on operative practical side and the output what are measurable but forget to work on mindset and spread it to the employees.

Based on this results and literature research following factors are arising to measure the agile transformation:

- agile values in the organization,
- collaboration between employees,
- willingness to change.

This joint result from literature review and specialist interviews is used as the definition of leadership type and agile transformation.

Definition of dimensions for measurable criteria for agile transformation was established and a measurable way of the leadership type and agile work practice were selected. In the selection the leadership type was established and delimited to three leadership types.

After the specialist interviews characteristics for measuring agile transformation were worked out.

The joint result from literature review and specialist interviews is used by the author as the definition of leadership type and agile transformation.

In summary the following research dependency model arises:

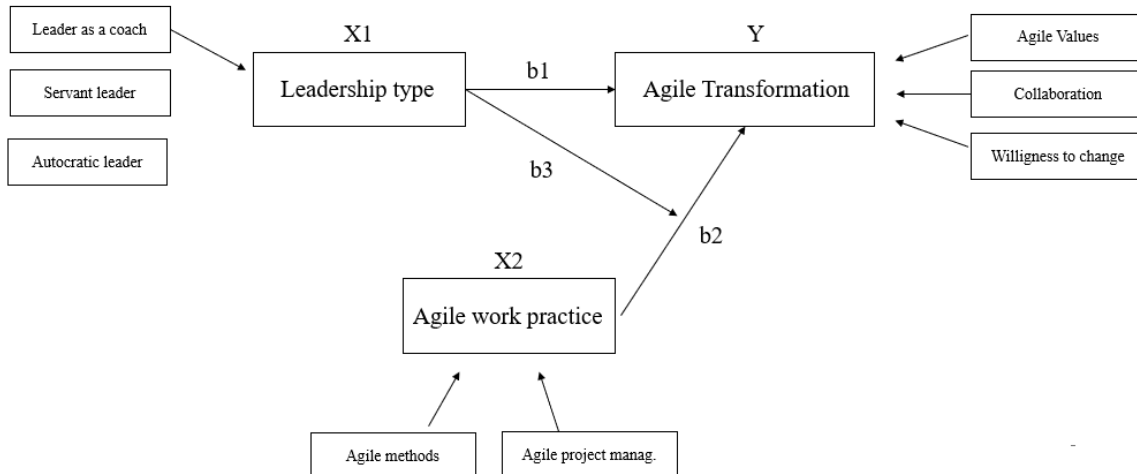


Figure 18: Research dependency model between leadership type and agile transformation

Source: Authors illustration

As a result of the specialist interviews, the research dependency model has been developed further and the dependent variable Y (agile transformation) and independent variable X1 (leadership type) and X2 (agile work practice) further defined. Based on the dependency model below a questionnaire for employees and the working process in the quantitative research have been elaborated in the subchapter 3.4.

At the first step b1 means, that there is a correlation from leadership type to agile transformation. At the second step b2 means that there is a correlation between agile work practice and agile transformation. And at the third step b3 means that leadership type has influence on the correlation between agile work practice and agile transformation.

Variables are measuring variables that have been included in the questionnaire and evaluated referring to the research dependency model.

The theoretical model has been implemented by including “leadership type” and “agile work practice” as independent variables in the regression models. The interaction between the two predictors is allowed, so that the models represent moderator analyses. The two predictors were mean centered before analysis and before the formation of the interaction term in order to achieve an easier interpretation of the regression coefficients²³⁸.

²³⁸ Aiken, L. S., West, S. G.: Multiple regression: Testing and interpreting interactions. Thousand Oaks, CS: Sage, 1991

As possible confounders, "time in company" and "time in current role" are first included in the models. They are removed from the models for reasons of model parsimony if they prove to be non-informative and have no significant influence. In these cases, only the more parsimonious models are reported. Following the same logic, the interaction terms and the non-significant predictors are excluded from the models. If the interaction term is significant, both predictors that form the interaction term remain in the model, significant or not, following the recommendation of Kam and Francese²³⁹ and Hair et al²⁴⁰.

The regressions have the following form:

$$y = a + b_1 * x_1 + b_2 * x_2 + b_3 * (x_1 * x_2) + e$$

y = dependent variable

a = intercept

b₁, b₂, b₃ = unstandardized regression coefficients

x₁ = leadership type

x₂ = agile work practice

x₁*x₂ = interaction term

e = error term

The calculation and results of regression analysis are at the end of the chapter, described in "results of hypothesis testing".

3.4 Evaluation of employees' survey in quantitative research

The survey has been developed and carried out in Germany, therefore the survey has been formulated in the German language. The first language of most employees is German, and it is easier for people if they read and respond in the first language.

But for avoiding any misunderstandings to misinterpretations, the English translation is also included in this thesis. Similar questions or addressing in a one question two or more issues were also avoided. It should not be a complicated construction of a word order.

²³⁹ Kam, C. D., Francese, R. J.: Modeling and Interpreting Interactive Hypotheses in Regression Analysis, Ann Arbor, The University of Michigan Press, 2007, pp. 99-102

²⁴⁰ Hair, J. F., Black, W. C., Babin, B. J., Anderson R. E.: Multivariate data analysis. Harlow: 7th Edition. Pearson Education Limited, 2014

So in Germany in the year 2018 there were 65.469 companies. Companies are economically oriented organizational units whose goal is to generate a profit. 99 % of the companies belong to small and medium size companies but SMEs have a significantly lower share of turnover²⁴¹. As described in the introduction of this thesis the interviewed participants were from companies with 48.000 employees. In the following table the information about the companies has been indicated:

Table 6: The number of employees of selected companies

Company Name	Number of employees	Turnover
Audi	90.640	55,68 bil. Euro (2019)
Siemens	293.000	57,1 bil. Euro (2020)
Liebherr	48.049	11.750 mio. Euro (2019)

Source: Author`s creation based on internet research²⁴²

To do the survey people can be asked in private networking spaces but if the employees have to be asked in companies a permission is needed. Because of COVID-19 what happened at the beginning of 2020 all kind of exhibitions or conferences were forbidden. So, for this reason the survey was online.

The selection of people was focused more on employees and not on leaders. Also, it is needed to determine the closeness to the daily work and project work.

Descriptive statistics has been used at this point. The sample size in total is 111 completed

²⁴¹ Statista research: Unternehmen in Deutschland: Anzahl der rechtlichen Einheiten in Deutschland nach Beschäftigungsgrößen 2019, Source: [https://de.statista.com/statistik/daten/studie/1929/umfrage/unternehmen-](https://de.statista.com/statistik/daten/studie/1929/umfrage/unternehmen-nach-)

[eschaeftigtengroessenklassen/#:~:text=Rechtliche%20Einheiten%2F%20Unternehmen%20nach%20Besch%C3%A4ftigtengr%C3%B6%C3%9Fenklassen%202018&text=Im%20Jahr%202018%20gab%20es,sozialversicherungspflichtig%20Besch%C3%A4ftigten%20\(Stand%3A%202013](https://de.statista.com/statistik/daten/studie/1929/umfrage/unternehmen-nach-eschaefigtengroessenklassen/#:~:text=Rechtliche%20Einheiten%2F%20Unternehmen%20nach%20Besch%C3%A4ftigtengr%C3%B6%C3%9Fenklassen%202018&text=Im%20Jahr%202018%20gab%20es,sozialversicherungspflichtig%20Besch%C3%A4ftigten%20(Stand%3A%202013) , accessed 7. December 2021

²⁴²Audi: [https://www.audi.com/de/company/sustainability/we-are-audi.html#:~:text=Die%20Belegschaft%20in%20Zahlen,\(2018%3A%2091.477\)%20Mitarbeitenden](https://www.audi.com/de/company/sustainability/we-are-audi.html#:~:text=Die%20Belegschaft%20in%20Zahlen,(2018%3A%2091.477)%20Mitarbeitenden) accessed 12. April 2021

Siemens: <https://new.siemens.com/de/de/unternehmen/ueber-uns.html> accessed 12. April 2021

Statista research. Liebherr: <https://de.statista.com/statistik/daten/studie/278995/umfrage/anzahl-der-mitarbeiter-des-schweizer-unternehmens-liebherr-nach-region/#:~:text=Liebherr%20%2D%20Mitarbeiter%20nach%20Region%20weltweit%202021&text=Die%20Gesamtzahl%20der%20Besch%C3%A4ftigten%20von%20Liebherr%20betrug%20im%20genannten%20Jahr%2049.611>. accessed 12. April 2021

questionnaires of which most of the respondents are employees and 32 are leaders. Due to a high number of missing values answers, one dataset was excluded from analysis because of some missing answers. Two answers showed one missing value on one of the variables from the leadership type variable list. The two former persons were excluded from cluster and factor analysis but could be included in the regression models by estimating the missing values.

The developed questionnaire is structured in a general section with personal questions and questions about the agile experience supported by three main questions. The questions refer to the main information.

By answering the questions about the agile experience, it is important to know how long they have been in the company and how long in the current role. Both language version, German and English, of the questionnaire are indicated in the appendix 1 – quantitative questionnaire. To explore the role of various persons working in projects, it was necessary to interview a wide sample of people employed in companies.

Practicalities determined the way the survey was conducted. While the quality and amount of the information to be gathered was important, time restrictions demanded to consider how much information could be analyzed and what resources were available. Thus, a self-completed questionnaire presented itself as the most viable alternative.

The survey included the same questions for everyone, and the online tool Microsoft Forms allowed to monitor the time. Because of self-filling and answering the questionnaire there is no chance for any change of questions so for this reason misunderstandings can happen. This problem does not pose a risk in this case, as the survey addresses highly educated, well-trained employees.

The criteria for selection of taking part in the quantitative research are combination of following three criteria:

1. Employees have to work in departments, administration areas.
2. In a company with a number of employees over 48.000.
3. Previous experience with classic and agile approaches.

The selection of participants was done accordingly. This was also considered while selecting interviews. Filling out the questionnaire about 10 minutes. Employees had enough time

to answer the questionnaire.

Participation was voluntary and at the beginning the participants had the information that the questionnaire is anonymous. The respondents are asked for their individual opinion.

They could specify their level of agreement or disagreement on a symmetric agree/disagree Likert scale with five possible responses: highly agree, agree, undecided, disagree and strongly disagree. The items were phrased as statements, not as questions to avoid any negative bias by answering the questions.

At the beginning general questions were asked and the results are content in the following table:

Table 7: Background variables in a framework of general questions

How many years have you been in the company?		Frequency amount	Valid percent
Valid	1-5 years	30	27.3
	6-10 years	23	20.9
	11-15 years	21	19.1
	more than 15 years	36	32.7
	Total	110	100.0

How many years are you in your position?		Frequency amount	Valid percent
Valid	1-5 years	75	68.2
	6-10 years	22	20.0
	11-15 years	7	6.4
	more than 15 years	6	5.5
	Total	110	100.0

Are you in a manager position?		Frequency amount	Valid percent
Valid	no	79	71.8
	yes	31	28.2
	total	110	100.0

Please select a suitable option		Frequency amount	Valid percent
Valid	I am familiar with the agile philosophy and methodology	27	24.8
	I worked selectively in reference to agile elements / methods	29	26.6

	I have already worked with the agile methods	33	30.3
	I have already implemented agile projects	16	14.7
	I give training on agile topics and act as a coach	4	3.7
	total	109	100.0
Missing		1	
Total		110	

Source: Author`s creation based on quantitative research results

Interesting finding to mention that most employees are familiar to agile approach but only few realized agile projects or working as coaches.

The questions that were asked in general and tend to form background information and for this reason be a background variable are followed by variables that identify leadership type, agile work practice and agile transformation in the following table:

Table 8: Main indicators of descriptive statistics for all variables

Number	Variable label	N	Mean	Std. Deviation	Median	Mode
v1	Agile methods are known in the company and are already in use	110	3.75	1.10	4	4
v2	Agile project management is already established in the company and is being used	110	3.25	1.24	4	4
v3	A manager in the company acts like a "coach" with his leadership style. The path is determined independently and only limited by the manager's guard rails. A manager adapts the guard rails to the maturity level of the team	109	3.53	1.21	4	4
v4	A manager makes many decisions in a centralized manner, even without the approval of the teams	110	3.03	1.36	3	4
v5	A manager adapts their leadership style according to the situation. Decisions are made together or left to the teams	110	3.58	1.13	4	4
v6	A manager is authentic, lives and acts according to an agile mindset and methods, even in difficult situations	110	3.50	1.17	4	4

v7	A manager lets the employees e.g. work according to agile methods and the project according to the ideas of the employees	109	3.58	1.08	4	4
v8	A manager specifies how the project implementation and methodology should be carried out	110	3.05	1.24	3	4
v9	For important fundamental decisions, the manager takes enough time to make a decision together with the teams by consensus	110	3.62	1.19	4	4
v10	A manager is open to new ideas and approaches that make a positive contribution to the company's success. Accordingly, it promotes the implementation of the ideas	110	4.00	1.02	4	4
v11	A change that is outside of my area of responsibility is difficult to implement; obstacles arise	110	3.66	1.21	4	4
v12	The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success	110	3.63	0.95	4	4
v13	The introduction of agile values and methods has improved team collaboration. The actions in the team are geared more towards customer value and employees help each other (no silo thinking)	110	3.82	1.10	4	4
v14	The agile approach has improved the efficiency and effectiveness of meetings	110	3.52	1.24	4	4
v15	The goal of agile transformation is understandable	110	3.68	1.03	4	4
v16	Agile methods and the agile way of working are seen as useful	110	3.88	0.90	4	4
v17	You can actively help shape the agile transformation	110	4.02	1.00	4	4

Source: Author`s creation based on SPSS evaluation results

Evaluation scale: from 1-5 where 1-totally disagree to 5-completely agree

In general, the answers from respondents were positive and alike from most of the respondents. Most of respondents gave evaluation 4 what means “agree” by the average 3 of the scale by the evaluation scale from 1-5, where 1 means totally disagree to 5 what means completely agree. In cases where the standard deviation is bigger the differences of respondents were also bigger. For example, variable 10 A manager is open to new ideas and approaches that make a positive contribution to the company's success.

Accordingly, it promotes the implementation of the ideas were alike from most or the respondents and the indicator of variability is small. From variable 3 A manager in the company acts like a "coach" with his leadership style. The path is determined independently and only limited by the manager's guard rails. A manager adapts the guard rails to the maturity level of the team to variable 10 A manager is open to new ideas and approaches that make a positive contribution to the company's success.

Accordingly, it promotes the implementation of the ideas. were used to identify types of answering persons, differing in terms of leadership type. One half of all individual data is always smaller, the other larger than the median. For an even number of individual data, the median is half the sum of the two values lying in the middle.

Answers with the category 4 what means agree was the most often selected category (mode) for all of the variables. Given the 5-point-scale from 1-totally disagree to 5-completely agree, this is a clear sign for a general tendency of most respondents, to agree to a positive understanding of the different aspects of agile transformation. This interpretation of results is confirmed by the median values and the arithmetic means. For the median values, all medians are 4, except for variable 4 A manager makes many decisions in a centralized manner, even without the approval of the teams and variable 8 A manager specifies how the project implementation and methodology should be carried out.

So in general, the medians show a tendency to agreement for all items except for variable 4 and variable 8 where half of the respondents chose answer categories 1-totally disagree, 2-disagree or 3-undecided, and the other half selected 3-undecided, 4-agree or 5-completely agree. All mean values are larger than 3, thus show a tendency to agreement for all of the items. However, the arithmetical mean values of items variable 4 A manager makes many decisions in a centralized manner, even without the approval of the teams and variable 8 A manager specifies how the project implementation and methodology should be carried out

are very close to 3 (3.03 and 3.05, respectively), so there is only a marginal tendency to a general agreement for these two items. These two variables give the information about the autocratic leadership style and for this reason they interpreted positive in the direction of agile transformation in the company.

The Hierarchical cluster analysis was analyzed and supported by cluster method Ward²⁴³ and squared Euclidean distance.

In a second approach to identify patterns in the respondent's answers, exploratory factor analysis (principal axis factoring, oblique rotation) was conducted, again using variables v3-v10.

Factor analysis is a method of multivariate statistics. It is used to infer a few underlying latent variables ("factors") from empirical observations of many different manifested variables. The discovery of these mutually independent variables or characteristics is the point of the data-reducing (also dimension-reducing) method of factor analysis²⁴⁴.

The solution from factor analysis was used to test the hypotheses. These analyses were performed using separate regression models with the „leadership type“ variable from factor analysis as independent variable (possible predictor). The “agile work practice” variable was used as independent variable 1 Agile methods are known in the company and are already in use and variable 2 Agile project management is already established in the company and is being used.

The „agile transformation“ variables from variable 11 A change that is outside of my area of responsibility is difficult to implement; obstacles arise to variable 17 You can actively help shape the agile transformation were used as dependent variables.

Unstandardized as well as standardized coefficients are reported. Standardized coefficients are interpreted as: 0.1 = small association, 0.3 = medium association, and 0.5= strong association, following the recommendation of Cohen²⁴⁵ and Hair et al²⁴⁶.

²⁴³ Ward's method is a criterion applied in hierarchical cluster analysis. Ward's minimum variance method is a special case of the objective function approach originally presented by Joe H. Ward.

²⁴⁴ Hair, J. F., Black, W. C., Babin, B. J., Anderson R. E.: Multivariate data analysis. Harlow: 7th Edition. Pearson Education Limited, 2014

²⁴⁵ Cohen, J.: A Power Primer. Quantitative Methods in Psychology. Psychological Bulletin, 112 (1), 1992, p. 157

²⁴⁶ Hair, J. F., Black, W. C., Babin, B. J., Anderson R. E.: Multivariate data analysis. Harlow: 7th Edition. Pearson Education Limited, 2014

In the quantitative research of this thesis were used following multivariate analysis methods: cluster analysis, factor analysis and regression analysis. The procedure of regression was done by using IBM SPSS Statistics. The results of the regression analysis are at the end of the chapter.

P-values smaller than 0.05 are interpreted as significant.

In statistics, one usually works with the following three levels or limits of significance:

$p \leq 0.05$: significant (probability of error less than 5%)

$p \leq 0.01$: very significant (probability of error less than 1%)

$p \leq 0.001$: highly significant (probability of error less than 1 ‰).

Results from factor analysis

Exploratory factor analysis by principal axis factoring, following the recommendations of Costello and Osborne²⁴⁷ and Hair et al.²⁴⁸ were used to investigate the correlative structure of the „leadership type“ variables in order to find out if a combination of variables could be used to identify different leadership types in companies.

The first eigenvalue was 4.61, the second eigenvalue was 0.85. An eigenvalue larger than 1 means that this factor explains more variance than one item in average. The eigenvalue criterion defines such factors as good and factors that explain less than one average item as too weak.

²⁴⁷ Costello, A. B., Osborne, J. W.: Exploratory Factor Analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, and Evaluation*, 10 (7), 2005, pp.1-9

²⁴⁸ Hair, J. F., Black, W. C., Babin, B. J., Anderson R. E.: *Multivariate data analysis*. Harlow: 7th Edition. Pear-son Education Limited, 2014

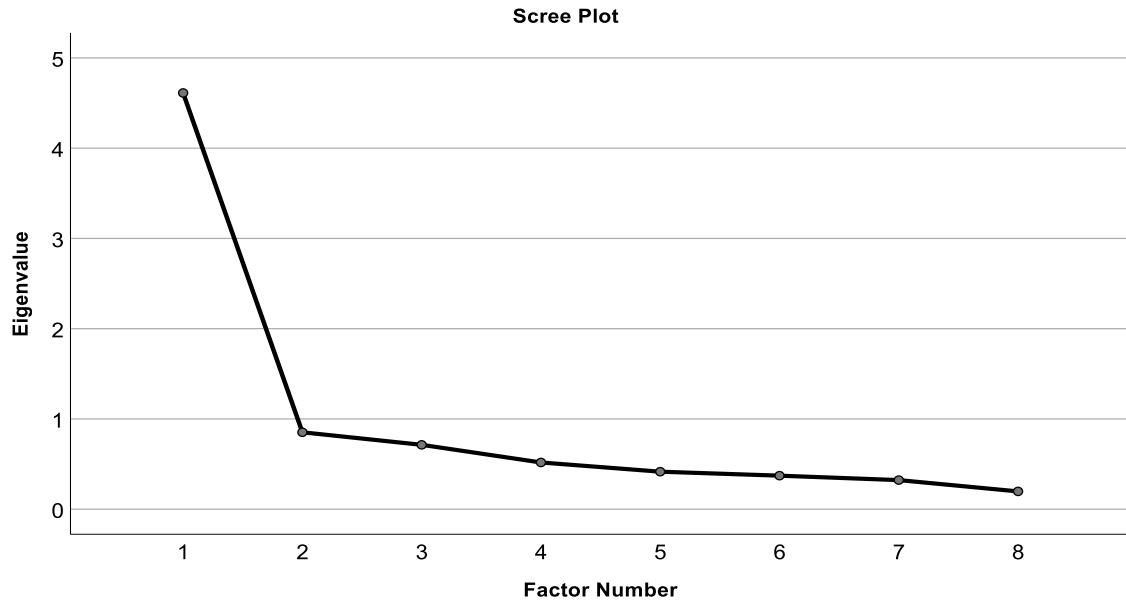


Figure 19: Scree plot of leadership type

Source: Author's illustration based on SPSS results

Following the eigenvalue criterion, the eight variables in the table 9 forms the variable: "leadership type". This factor explained 58 percent of the variance of all items. Following the eigenvalue criterion, a one factor solution fits the data.

Table 9: Factor loadings of variables

Variables: Questions in the questionnaire	Factor loadings
v5 A manager adapts their leadership style according to the situation. Decisions are made together or left to the teams	.819
v9 For important fundamental decisions, the manager takes enough time to make a decision together with the teams by consensus	.806
v10 A manager is open to new ideas and approaches that make a positive contribution to the company's success. Accordingly, it promotes the implementation of the ideas	.765
v3 A manager in the company acts like a "coach" with his leadership style. The path is determined independently and only limited by the manager's guard rails. A manager adapts the guard rails to the maturity level of the team	.749
v7 A manager lets the employees e.g., work according to agile methods and the project according to the ideas of the employees	.742
v6 A manager is authentic, lives and acts according to an agile mindset and methods, even in difficult situations	.741

v4 A manager makes many decisions in a centralized manner, even without the approval of the teams	-.649
v8 A manager specifies how the project implementation and methodology should be carried out	-.430

Source: Author's illustration based on SPSS results

Only one factor was extracted, so, no rotation could be applied or was necessary to interpret the results. Four iterations were required to find a solution. All variables in this analysis, from variable 3 A manager in the company acts like a "coach" with his leadership style.

The path is determined independently and only limited by the manager's guard rails. A manager adapts the guard rails to the maturity level of the team to variable 10 A manager is open to new ideas and approaches that make a positive contribution to the company's success. Accordingly, it promotes the implementation of the ideas, were included in this complex factor "leadership type".

The factor loadings are standardized regression coefficients and interpreted as the associations between the factor and the single items. For variables v3 A manager in the company acts like a "coach" with his leadership style. The path is determined independently and only limited by the manager's guard rails. A manager adapts the guard rails to the maturity level of the team, v5 A manager adapts their leadership style according to the situation. Decisions are made together or left to the teams, v6 A manager is authentic, lives and acts according to an agile mindset and methods, even in difficult situations, v7 A manager lets the employees e.g., work according to agile methods and the project according to the ideas of the employees, v9 For important fundamental decisions, the manager takes enough time to make a decision together with the teams by consensus and v10 A manager is open to new ideas and approaches that make a positive contribution to the company's success.

Accordingly, it promotes the implementation of the ideas, all factor loadings are between .741 and .819. These coefficients can be squared to express the explained part of the variance of the items by the factor. Thus, the latent construct (the factor) explains between 55 % - variable 6 A manager is authentic, lives and acts according to an agile mindset and methods, even in difficult situations 6 and 67 % - variable 5 A manager adapts their leadership style according to the situation. Decisions are made together or left to the teams of the variances of these variables.

As could be expected, given the wording of the items, variable 4 A manager makes many decisions in a centralized manner, even without the approval of the teams and variable 8 A manager specifies how the project implementation and methodology should be carried out had negative loadings in contrast to all other items with positive loadings. The factor loadings of these items are -.649 and -.430, so the explained variances of these items are 42 % and 18 %, respectively.

This value ranges from 67 % for variable 5 A manager adapts their leadership style according to the situation. Decisions are made together or left to the teams to 18 % for variable 8 A manager specifies how the project implementation and methodology should be carried out. As could be expected, given the wording of the items, variable 4 A manager makes many decisions in a centralized manner, even without the approval of the teams and variable 8 A manager specifies how the project implementation and methodology should be carried out had negative loadings in contrast to all other items with positive loadings.

After recoding of variable 4 and variable 8, all variables are in the same direction with higher values on the response scale meaning a higher degree of „coach-ness“, a smaller value meaning a higher degree of „autocratic-ness“. Thus, the latent factor behind these variables can be interpreted as a continuum between these two poles of leadership type.

The eight variables showed a high reliability with Cronbach's alpha = 0.888. Item selectivity was good with an item-total-correlation of at least 0.4 for all variables. Therefore, all eight variables can be included in the calculation of the factor variable, including variable 8 A manager specifies how the project implementation and methodology should be carried out with the rather low association to the latent factor.

The results from factor analysis were used to calculate a single predictor, measuring the degree of autocratic resp. coach-leadership type. This variable was calculated using the mean value of all valid values on variable 3 A manager in the company acts like a "coach" with his leadership style. The path is determined independently and only limited by the manager's guard rails. A manager adapts the guard rails to the maturity level of the team" to variable 10 A manager is open to new ideas and approaches that make a positive contribution to the company's success. Accordingly, it promotes the implementation of the ideas for every person (row mean).

This way, this variable does express the type of leadership type of a person with a larger value meaning the person is more of a coach and a smaller value that the person leans towards an autocratic leadership type. A mean value of 3.47 (SD=0.88) and the inspection of the histogram of predictor variable reveal, that the answering persons in general tend to the coach style of leadership, but the new variable „type“ has enough variance to discriminate between persons with more or less affiliation to the coach style, so the use in regression models makes sense.

The result from factor analysis allows to differentiate persons on a scale between “coach-ness” and “autocratic-ness”. The third group “servant leader” cannot be identified, using the result from factor analysis.

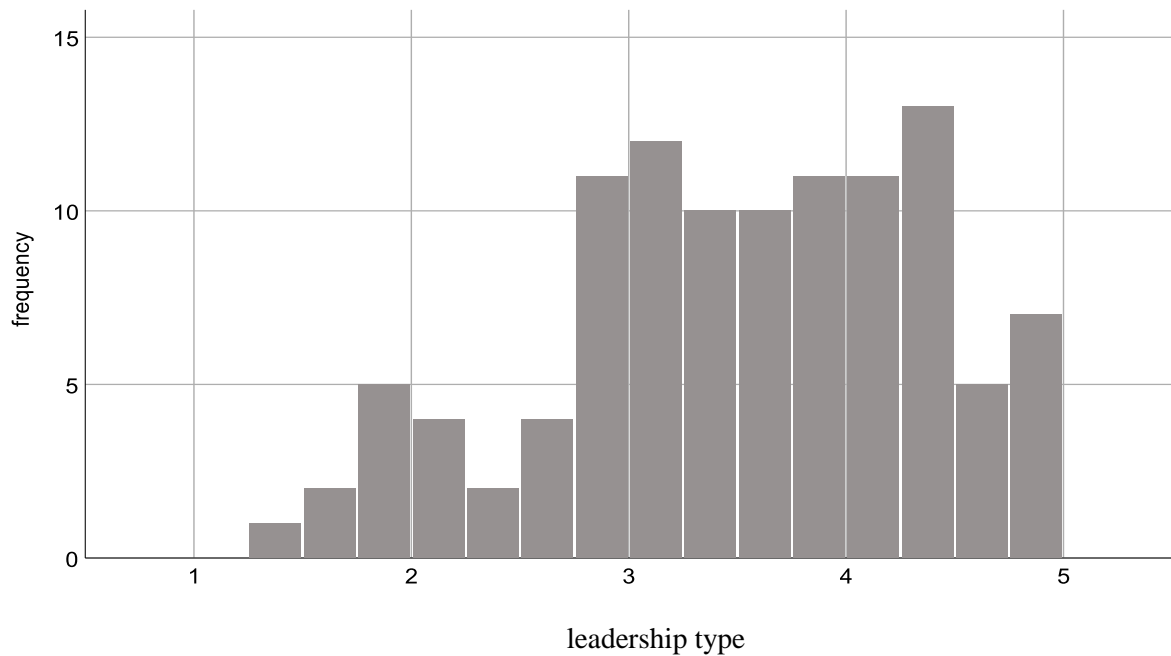


Figure 20: Histogram of predictor variable „leadership type“

Source: Source: Author’s illustration based on SPSS results

Evaluation scale: measuring from extreme autocratic (1) to extreme coach (5)

The histogram reflects the leadership behaviors in companies. Bars in the histogram are answers of the respondents. The answers were done from 1-totally disagree to 5-completely agree scale. The more the value the more the respondent with his answer tend to the coach type. The lower is the value the more the respondent with his answer tend to the autocratic type.

This variable can reach values between 1- “extreme autocratic” to 5-“extreme coach”. On the y-axis, the frequencies of the values of leadership type are displayed. It is evident from the histogram, that most respondents have values larger than 3.

Thus, in general there is a strong tendency in the data: The respondents in average tend to support the coach style much more than the autocratic style. Looking at the extreme values of the leadership type variable, there is no respondent with the value 1, so nobody who has the extreme value for autocratic style. On the other hand, there are seven cases with the maximum value of 5-extreme coach style.

Results of Cluster Analysis

In order to identify groups of answering persons, defined by leadership type, exploratory cluster analysis on variables v3-v10 was performed (Ward method with squared Euclidian distance).

The result of the cluster analysis was assessed using the dendrogram.

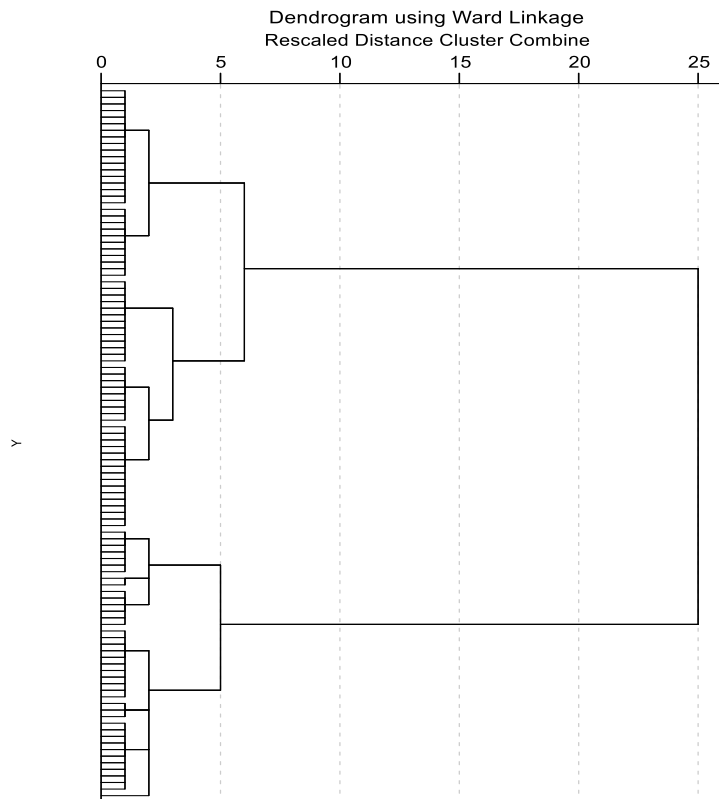


Figure 21: Cluster analysis: Dendrogram using Ward Linkage

Source: Author’s illustration based on SPSS results

The dendrogram is a tree diagram used to visualize and classify taxonomic relationships frequently used to illustrate the arrangement of the clusters produced by hierarchical clustering. Cases with similar answering patterns on the variables in the analysis are linked early, from left to right in the diagram; groups of cases with small similarities are linked at a late stage.

The dendrogram clearly shows that only a two-cluster solution fits the data. This, again, contradicts our expectation that there should be three leadership types visible in the data. However, the result of the cluster analysis is very clear: Only two groups can be identified: coach as a leader and autocratic leader.

To describe the two clusters, their mean values on the variables, defining the groups, are calculated:

Table 10: Main indicators of descriptive statistics for groups by using factor analysis

Nr.	Variable Description	Group 1 Leader as coach (N=67)		Group 2 Autocratic leader (N=41)		Total (N=108)	
		Mean (Me- dian; Mode)	SD	Mean (Me- dian; Mode)	SD	Mean (Me- dian; Mode)	SD
v3	A manager in the company acts like a "coach" with his leadership style. The path is determined independently and only limited by the manager's guard rails. A manager adapts the guard rails to the maturity level of the team.	4,10 (4; 4)	0,78	2,61 (3; 1, 2, 4)	1,24	3,54 (4; 4)	1,2 2
v4	A manager makes many decisions in a centralized manner, even without the approval of the teams.	2,39 (2; 2)	1,19	4,02 (4; 4)	0,96	3,01 (3; 4)	1,3 6
v5	A manager adapts their leadership style according to the situation. Decisions are made together or left to the teams.	4,25 (4; 4)	0,53	2,51 (2; 2)	1,00	3,59 (4; 4)	1,1 3
v6	A manager is authentic, lives and acts according to an agile mindset and methods, even in difficult situations.	4,13 (4; 4)	0,76	2,46 (2; 2)	1,00	3,50 (4; 4)	1,1 8
v7	A manager lets the employees e.g. work according to agile methods	4,07 (4; 4)	0,77	2,76 (3; 3)	1,04	3,57 (4; 4)	1,0 9

	and the project according to the ideas of the employees						
v8	A manager specifies how the project implementation and methodology should be carried out	2,78 (3; 4)	1,25	3,46 (4; 4)	1,10	3,04 (3; 4)	1,2 4
v9	For important fundamental decisions, the manager takes enough time to make a decision together with the teams by consensus.	4,33 (4; 4)	0,56	2,46 (2; 2)	1,05	3,62 (4; 4)	1,2 0
v10	A manager is open to new ideas and approaches that make a positive contribution to the company's success. Accordingly, it promotes the implementation of the ideas.	4,49 (5; 5)	0,64	3,22 (3; 4)	1,06	4,01 (4; 4)	1,0 3

Source: Author`s creation based on SPSS analysis

Evaluation scale: from 1-5 where 1-totally disagree to 5-completely agree

The table content the variables and their means, standard deviations, median and mode.

The standard deviation for almost every mean value is smaller for the two groups than for the total. The mean values differ clearly between the two groups on every variable. This descriptive finding is supported by t-tests (with Satterthwaite correction for heterogeneity of variances): The means of the two groups differ significantly for all eight items with all p-values < .01. Both – (1) relatively small standard deviation in the groups compared to the total and (2) differences in mean values – confirm the reliability and appropriateness of the cluster analysis.

Leader as a coach – group 1 (67 persons) has larger mean values than group 2 – autocratic leader, and mean values well above the arithmetical mean of the scale, of all variables except for v4 and v8. Therefore, this group can be defined as “coaches”.

This does not mean, however, that these persons are in actual fact coaches, but their attitudes on the reported variables can be interpreted in a way, that they have a leadership type that is close to the coach-type.

Autocratic leader – group 2 (41 persons) on the other hand has relatively low mean values on these variables, almost all of them below the arithmetical mean of the scale, and relatively high values for variables v4 and v8.

Thus, this group is labeled „autocratic type“ but their attitudes on the reported variables can be interpreted in a way, that they have a leadership type that is tending to autocratic leadership.

An interesting finding is included in the following table:

Table 11: Data on variables about agile experience

Leadership type	I am familiar with the agile philosophy and methodology	I worked selectively in reference to agile elements / methods	I have already worked with the agile methods	I have already implemented agile projects	I give training on agile topics and act as a coach	Total
Coach type	15	18	19	12	2	66
	22,7%	27,3%	28,8%	18,2%	3,0%	100,0%
Autocratic type	12	10	13	4	2	41
	29,3%	24,4%	31,7%	9,8%	4,9%	100,0%
Total	27	28	32	16	4	107
	25,2%	26,2%	29,9%	15,0%	3,7%	100,0%

Source: Author`s creation based on quantitative research results

In the conclusion of the table with the autocratic leadership the agile approach and agile way of working is also established. So, in this case it is possible that there is a period of transformation, or the agile way of working is a hybrid model of autocratic leadership style. Interesting finding is that there are two answers with the statement that they already giving agile trainings or working as agile coaches and are still near to autocratic leadership.

Consequently, big companies are in agile transformation but still have characteristics of autocratic leadership because of decades of functional organization. For this reason, an “island” solution is possible where in specific areas agile approach and agile culture exist.

Results of hypothesis testing

Neither factor analysis not cluster analysis could confirm the expectation of three types in terms of leadership type in the data. Hypotheses testing would be possible with both results above – with the two groups from cluster analysis as well as with the factor analysis result. Since leadership type can be better understood as a continuum between an extreme of „max-

imal coach style” and „maximally autocratic style“, and since in real life the ideal type (servant leader) will be hardly found, the solution from factor analysis is used for hypotheses testing. This way, unnecessary data reduction by dichotomizing can be avoided²⁴⁹.

It is assumed that the different leadership types differ significantly in terms of agile transformation. Leadership types have been defined using the result of exploratory factor analysis as described above.

“Agile work practice” was measured by using two variables (agile methods and agile project management), the evaluation is included in the following tables. „Agile transformation“ was measured using seven variables. These variables are not going to be combined to one (or more) aggregated variable, because they are supposed to measure different aspects of agile transformation that will be interpreted separately. Therefore, seven regression models are used, with leadership type as moderator, agile work practice as independent variable, and the seven „agile transformation“ variables as dependents.

The following tables shows the results of the evaluation of seven variables including leadership type and agile work practice. In the tables there is shown the regression of leadership type and agile work practice to agile transformation and if leadership type has influence on the correlation of agile work practice and agile transformation.

Dependent Variable 11 A change that is outside of my area of responsibility is difficult to implement; obstacles arise.

Table 12: Results of regression analysis for dependent variable A change that is outside of my area of responsibility is difficult to implement; obstacles arise

Description	Unstandardized Coefficients		Standardized Coefficients	p
	B	Std. Error	Beta	
Intercept	3.74	0.11		<0.001
Leadership type.cen	-0.69	0.13	-0.50	<0.001
Agile work practice.cen ²⁵⁰	-0.17	0.11	-0.15	0.137
interact	-0.15	0.10	-0.13	0.132
R ²	0.33			

²⁴⁹ Baneshi, M. R., Talei, A. R.: Dichotomisation of Continuous Data: Review of Methods, Advantages, and Disadvantages. Iranian Journal of Cancer Prevention, 4 (1), 2011, pp. 26-32

²⁵⁰ type.cen: leadership type, mean centered; agile work practice.cen: agile work practice, mean centered; interact: interaction term between type.cen und agile work practice.cen

Source: Author's creation based on SPSS analysis

The independent variables leadership type and agile work practice which are included into the regression equation explain about 33 % of the variance of the dependent variable.

The interaction term has no statistically significant influence in the model ($p=0.132$), so the association between agile work practice and dependent variable A change that is outside of my area of responsibility is difficult to implement; obstacles arise is not significantly influenced by type. The dependent variable will be named in the following sentences A change outside of my responsibility is difficult to implement.

The association between agile work practice and the dependent variable A change outside of my responsibility is difficult to implement is not statistically significant ($p=0.137$), but the relationship between type and dependent variable A change outside of my responsibility is difficult to implement is negative, strong ($B=-0.69$, $\beta=-0.50$) and significantly different from zero ($p<0.001$).

In a model without the insignificant factors, R^2 reduces to 0.31. Type as a single predictor explains 31% of the variance of dependent variable A change outside of my responsibility is difficult to implement.

The association between type and dependent variable A change outside of my responsibility is difficult to implement is negative, strong and statistically significant ($B=-0.76$, $\beta=-0.55$, $p<0.001$). This means: The higher the value on type, the smaller the value on the dependent variable A change outside of my responsibility is difficult to implement (in average).

So, the more the person tends to the coach-style (higher values on ,type'), the less the person tends to agree to the statement on dependent variable: A change that is outside of my area of responsibility is difficult to implement; obstacles arise. In average, with a one point increase on the type scale from one to five, the values on dependent variable tend to decrease by 0.76.

Dependent Variable 12 The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success.

Table 13: Results of regression analysis for dependent variable *The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success*

Description	Unstandardized Coefficients		Standardized Coefficients	p
	B	Std. Error	Beta	
Intercept	4.10	0.19		<0.001
Leadership type.cen	0.49	0.11	0.45	<0.001
Agile work practice.cen	0.10	0.09	0.12	0.249
interact	0.02	0.08	0.03	0.779
time in company	-0.19	0.07	-0.24	0.005
R ²	0.29			

Source: Author`s creation based on SPSS analysis

The independent variables leadership type and agile work practice which are included into the regression equation explain about 29 % of the variance of the dependent variable.

The interaction term has no statistically significant influence in the model ($p=0.779$), so the association between agile work practice and dependent variable *The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success* is not significantly influenced by leadership type. The dependent variable will be named in the following sentences *The employees understand the change*.

The association between agile work practice and dependent variable *The employees understand the change* is not statistically significant ($p=0.249$), but the relationship between type and dependent variable *The employees understand the change* is strong ($B=0.49$, $\beta=0.45$) and significantly different from zero ($p<0.001$). In average, with a one-point increase on the type scale from one to five, the values on dependent variable *The employees understand the change* tend to increase by 0.49 and the longer time in company, the smaller the values on the dependent variable *The employees understand the change*.

After removing the insignificant predictors, ‘type’ and ‘time in company’ remain in the model that still explains about 29 % of the dependent variable’s variance ($R^2=0.29$). Controlling for ‘time in company’ with a small to medium negative effect ($B=-0.19$, $\beta=-0.25$, $p=0.003$), ‘leadership type’ shows a positive and strong association with the dependent variable ($B=0.55$, $\beta=0.52$, $p<0.001$).

This means: The higher the value on type, the higher the value on dependent variable The employees understand the change (in average). So, the more the person tends to the coach-style (higher values on ,type‘), the higher the tendency to agree to the statement of the dependent variable The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success.

Dependent Variable 13 The introduction of agile values and methods has improved team collaboration. The actions in the team are geared more towards customer value and employees help each other (no silo thinking).

Table 14: Results of regression analysis for dependent variable The introduction of agile values and methods have improved team collaboration

Description	Unstandardized Coefficients		Standardized Coefficients	p
	B	Std. Error	Beta	
Intercept	3.75	0.11		<0.001
Leadership type.cen	0.30	0.13	0.24	0.025
Agile work practice.cen	0.22	0.11	0.22	0.058
interact	0.13	0.10	0.12	0.218
R ²	0.14			

Source: Author`s creation based on SPSS analysis

The independent variables leadership type and agile work practice which are included into the regression equation explain about 14% of the variance of the dependent variable.

The explained variance of 14% respectively is considerably lower compared to the previously described models (table 11, 33 % and table 12, 29 %) because the association between the predictors and the dependent variables is stronger in the models for dependent variable A change that is outside of my area of responsibility is difficult to implement; obstacles arise and dependent variable The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success. Moreover, the model for the dependent variable The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success includes an additional predictor (time in company) that explains an important part of the variance in the model.

The interaction term has no statistically significant influence in the model ($p=0.218$), so the association between agile work practice and dependent variable The introduction of agile values and methods have improved team collaboration is not significantly influenced by type.

The association between agile work practice and dependent variable The introduction of agile values and methods have improved team collaboration is nearly statistically significant ($p=0.058$), but the relationship between type and dependent variable The introduction of agile values and methods have improved team collaboration is medium/middle ($B=0.3$, $\beta=0.24$) and significantly different from zero ($p<0.001$).

After removing the insignificant variables, 'type' remains the only predictor in the model that now explains 11 % of the dependent variable's variance ($R^2=0.11$). The association between type and dependent variable The introduction of agile values and methods have improved team collaboration is positive and of medium effect size ($B=0.42$, $\beta=0.33$, $p<0.001$).

The higher the value on type, the higher the value on dependent variable The introduction of agile values and methods have improved team collaboration (on average).

So, the more the person tends to the coach-style (higher values on 'type'), the more tends to agree to the statement on dependent variable The introduction of agile values and methods has improved team collaboration. The actions in the team are geared more towards customer value and employees help each other (no silo thinking).

In average, with a one-point increase on the type scale from one to five, the values on dependent variable "The introduction of agile values and methods have improved team collaboration." tend to increase in average by 0.42 under the condition if other independent variables in the model stay the same.

Dependent Variable 14 The agile approach has improved the efficiency and effectiveness of meetings.

Table 15: Results of regression analysis for dependent variable *The agile approach has improved the efficiency and effectiveness of meetings*

Description	Unstandardized Coefficients		Standardized Coefficients	p
	B	Std. Error	Beta	
Intercept	3.45	0.13		<0.001
Leadership type.cen	0.13	0.15	0.09	0.407
Agile work practice.cen	0.32	0.13	0.28	0.017
interact	0.14	0.12	0.12	0.242
R ²	0.1			

Source: Author's creation based on SPSS analysis

The independent variables leadership type and agile work practice which are included into the regression equation explain about 10% of the variance of the dependent variable. The explained variance of 10% respectively is considerably lower compared to the previously described models (table 11, 33 % and table 12, 29 %) because the association between the predictors and the dependent variables is stronger in the models for dependent variable A change that is outside of my area of responsibility is difficult to implement; obstacles arise and variable The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success.

Moreover, the model for the dependent variable The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success includes an additional predictor (time in company) that explains an important part of the variance in the model.

The interaction term has no statistically significant influence in the model ($p=0.242$), so the association between agile work practice and dependent variable The agile approach has improved the efficiency and effectiveness of meetings is not significantly influenced by type.

The relationship between type and dependent variable A change that is outside of my area of responsibility is difficult to implement; obstacles arise is low ($B=0.13$, $\beta=0.09$) and not significantly different from zero ($p 0.407$).

The association between agile work practice and dependent variable The agile approach has improved the efficiency and effectiveness of meetings is statistically significant ($p=0,017$), positive and of moderate effect size ($B=0.32$, $\beta=0.28$).

After removing the insignificant variables from the model, the remaining ‘agile work practice’ explains about 8 % of the variance ($R^2=0.08$). The association between agile work practice and the perceived efficiency and effectiveness of meetings is positive, significant and of medium effect size ($B=0.33$, $\beta=0.29$, $p=0.003$). The higher the value on agile work practice, the higher the value on the dependent variable The agile approach has improved the efficiency and effectiveness of meetings (on average).

Dependent Variable 15 The goal of agile transformation is understandable.

Table 16: Results of regression analysis for dependent variable The goal of agile transformation is understandable

Description	Unstandardized Coefficients		Standardized Coefficients	p
	B	Std. Error	Beta	
Intercept	3.21	0.18		<0.001
Leadership type.cen	0.53	0.10	0.45	<0.001
Agile work practice.cen	0.26	0.09	0.27	0.004
interact	0.09	0.08	0.09	0.251
time in company	0.17	0.06	0.19	0.010
R ²	0.45			

Source: Author`s creation based on SPSS analysis

The independent variables leadership type and agile work practice which are included into the regression equation explain 45% of the variance of the dependent variable.

The interaction term has no statistically significant influence in the model ($p=0.251$), so the association between agile work practice and dependent variable The goal of agile transformation is understandable is not significantly influenced by type.

The association between agile work practice and dependent variable The agile approach has improved the efficiency and effectiveness of meetings is statistically significant ($p=0.004$).

The relationship between type and dependent variable A change that is outside of my area of responsibility is difficult to implement; obstacles arise is strong (B=0.53, beta=0.45) and significantly different from zero (p<0.001).

Time as a control variable has a positive and weak to moderate effect (B=0.17, beta=0.19, p=0.01).

Without interaction term, R² drops slightly to 0.44. In this reduced model, ‘type’ has a positive and strong effect (B=0.54, beta=0.46, p<0.001), ‘agile work practice’ shows a positive and weak to moderate association (B=0.22, beta=0.23, p=0.008). The influence of ‘time in company’ is weak to moderate with B=0.16, beta=0.19, p=0.011.

This means: The higher the value on type, the higher the value on dependent variable The goal of agile transformation is understandable (in average). So, the more the person tends to the coach-style (higher values on ,type‘), the higher the tendency to agree to the statement on dependent variable The goal of agile transformation is understandable.

In average, with a one-point increase on the type scale from one to five, the values on dependent variable The goal of agile transformation is understandable tend to increase by 0.54; with a one point increase on agile work practice, the values on dependent variable The goal of agile transformation is understandable tend to increase by 0.22.

The longer the time in company, the higher the value on dependent variable The goal of agile transformation is understandable.

Dependent Variable 16 Agile methods and the agile way of working are seen as useful.

Table 17: Results of regression analysis for dependent variable Agile methods and the agile way of working are seen as useful

Description	Unstandardized Coefficients		Standardized Coefficients	Sig.
	B	Std. Error	Beta	
(Constant)	3.74	0.08		<0.001
Leadership type.cen	0.09	0.10	0.08	0.395
Agile work practice.cen	0.39	0.09	0.47	<0.001
interact	0.29	0.08	0.34	<0.001
R ²	0.25			

Source: Author`s creation based on SPSS analysis

The independent variables leadership type and agile work practice which are included into the regression equation explain 25 % of the variance of dependent variable “Agile methods and the agile way of working are seen as useful.

The interaction between type and agile work practice is significant ($p < 0.001$), positive and moderately strong ($B = 0.29$, $\beta = 0.34$, $p < 0.001$). For high values on type, the positive association between agile work practice and dependent variable Agile methods and the agile way of working are seen as useful gets stronger. With a one-unit increase in type, the association between agile work practice and dependent variable Agile methods and the agile way of working are seen as useful gets stronger by 0.29. For low values on type, the association between agile work practice and dependent variable Agile methods and the agile way of working are seen as useful tends against zero.

In this model, the insignificant factor type is not excluded, following the recommendation of Kam and Francese²⁵¹, that such insignificant factors generally should remain in the model if the interaction with the factor is in the model.

In order to analyze the significant interaction effect in more detail, the model was again run, using procedure PROCESS for SPSS version 3.5 by Andrew F. Hayes (2017). PROCESS allows to describe and test conditional effects.

Table 18: Conditional effects for different values of the moderator agile work practice

Description	Unstandardized coefficients of the association between type and v16		p
	B	Std. Error	
type.cen = -0.84	0.15	0.09	0.097
type.cen = 0.03	0.40	0.09	<0.001
type.cen = 0.91	0.65	0.13	<0.001

Source: Author's creation based on SPSS analysis

For low values on type, the association between agile work practice and dependent variable Agile methods and the agile way of working are seen as useful is weak and statistically not significant ($B = 0.15$, $p = 0.097$). For type values around the median, the association between

²⁵¹ Cindy, D., Kam, R. J. F.: Modeling and Interpreting Interactive Hypotheses in Regression Analysis, Ann Arbor: The University of Michigan Press, 2007, p. 99-102

agile work practice and dependent variable Agile methods and the agile way of working are seen as useful is positive, relatively strong and statistically significant ($B=0.40$, $p<0.001$). For large values on type, the association between agile work practice and dependent variable Agile methods and the agile way of working are seen as useful gets stronger ($B=0.65$, $p<0.001$).

Dependent Variable 17 You can actively help to shape the agile transformation.

Table 19: Results of regression analysis for dependent variable You can actively help to shape the agile transformation

Description	Unstandardized Coefficients		Standardized Coefficients	p
	B	Std. Error	Beta	
Intercept	3.43	0.18		<0.001
Leadership type.cen	0.35	0.10	0.31	0.001
agilework practice.cen	0.28	0.08	0.30	0.001
interact	-0.07	0.07	-0.08	0.321
time in company	0.24	0.06	0.29	<0.001
R ²	0.44			

Source: Author's creation based on SPSS analysis

The independent variables leadership type and agile work practice which are included into the regression equation explain 44 % of the variance of dependent variable “You can actively help to shape the agile transformation”.

The interaction term has no statistically significant influence in the model ($p=0.321$), so the association between agile work practice and dependent variable The goal of agile transformation is understandable is not significantly influenced by type.

The association between agile work practice and dependent variable You can actively help to shape the agile transformation is statistically significant ($p=0.001$) and so in this case there existing a correlation of agile work practice and active help to shape the agile transformation.

The relationship between type and dependent variable A change that is outside of my area of responsibility is difficult to implement; obstacles arise is medium ($B=0.35$, $\beta=0.31$) and significantly different from zero ($p<0.001$).

Time in company as a control variable has a positive and medium effect ($B=0.24$, $\beta=0.29$, $p<0.001$).

After removing the insignificant interaction from the model, the model still explains about 44 % of the dependent variable's variance ($R^2=0.44$).

Type still has a positive, medium, and significant association with the perceived possibility to actively help to shape the agile transformation ($B=0.35$, $\beta=0.31$, $p=0.001$), that relation between agile work practice and the dependent variable in the model likewise is positive and of medium effect ($B=0.31$, $\beta=0.33$, $p<0.001$). The influence of 'time in company' as well is positive and of medium effect size ($B=0.25$, $\beta=0.3$, $p<0.001$).

This means: The higher the value on type, the higher the value on dependent variable: You can actively help to shape the agile transformation (on average). So, the more the person tends to the coach-style (higher values on 'type'), the higher the tendency to agree to the statement on dependent variable: You can actively help shape the agile transformation. The same goes for agile work practice: The higher the value on agile work practice (in average), the higher the value on the dependent variable. Likewise, the longer the time in company, the higher the value on dependent variable You can actively help to shape the agile transformation.

3.5 Statements of hypothesis and thesis for defense testing

Main hypothesis and thesis for defense:

Main hypothesis:

Consideration of a leader predominantly as a coach and agile work practice influences the agile transformation in companies.

Yes, predominantly one leadership type leader as a coach and agile work practice influence the agile transformation which has been analyzed in the correlation analysis.

Theses to be defended:

1. Leadership type, agile work practice and agile transformation can be defined and measured by characteristics.

Leadership type can be operationalized and defined by three leadership types:

- Leader as a Servant.
- Leader as a Coach.
- Autocratic Leader.

Agile work practice can be operationalized and defined by two areas:

- Agile methods.
- Agile project management.

Agile transformation can be operationalized and defined by three areas:

- Agile values.
- Collaboration.
- Willingness to change.

2. Leader predominantly as a coach fits the agile transformation.

According to evaluation of quantitative research coach as a leader fits predominantly to the agile transformation.

3. A clear relationship between agile work practice and agile transformation exists.

Yes, there is a relationship between agile work practice and agile transformation.

4. One leadership type has influence on the relationship between agile work practice and agile transformation.

Yes, coach as a leader has influence on the relationship between agile work practice and agile transformation.

In the comparison of the literature review and the study, there is the conclusion that agile transformation is a lengthy process that requires a structure and goals in several stages. A large company with thousands of employees cannot change in a very short time. Leadership has a great influence on employee performance and thus ultimately on the performance of the teams. Even or especially in the agile working environment, the implementation of good leadership is fundamental.

Research problem

Traditional organizations are not designed for the dynamic development of the changing economy but the company's ability to change becomes a critical success factor. Agile work practice gives the companies to act and react flexible in a short period of time. So, for this reason the agile transformation of companies is a prerequisite to be able to master the challenges.

The agile transformation of companies is a complex change process because, in addition to the level of technology/manufacturing processes, it also includes the structural, process and cultural levels. It also requires changes in attitude and behavior from all those directly and indirectly. Barriers to agile transformation are multifaceted, organizational cultural issues and general resistance to change should be considered significant impediments to full transition and achievement of sustainable organizational agile work practice.

The required level of flexibility and adaptability is not enough to transform only a business unit. Rather a company-wide agile transformation must ensure that all business units, from the definition of a business strategy to operational implementation work agile. When it comes to becoming a more agile company with a high level of agile work practice, it is above all company leaders that is crucial. Leader needs a lot of courage and foresight to start a change early enough.

This thesis tries to give an answer to the connections and influences between agile work practice, leadership type and the agile transformation. The picture that emerges is that a company should work out a concept where infrastructure etc. does not come first, but rather where leadership type and agile work practice are defined and developed as a decisive basic factor for the effective agile transformation.

3.6 Conceptual model for companies

Based on research dependency model and qualitative and quantitative results the following conceptual model was developed by the author of this thesis.

The following model is for the companies that have already started or wish to start with agile approach to improve their products, to reduce their delivery time and to decrease their costs.

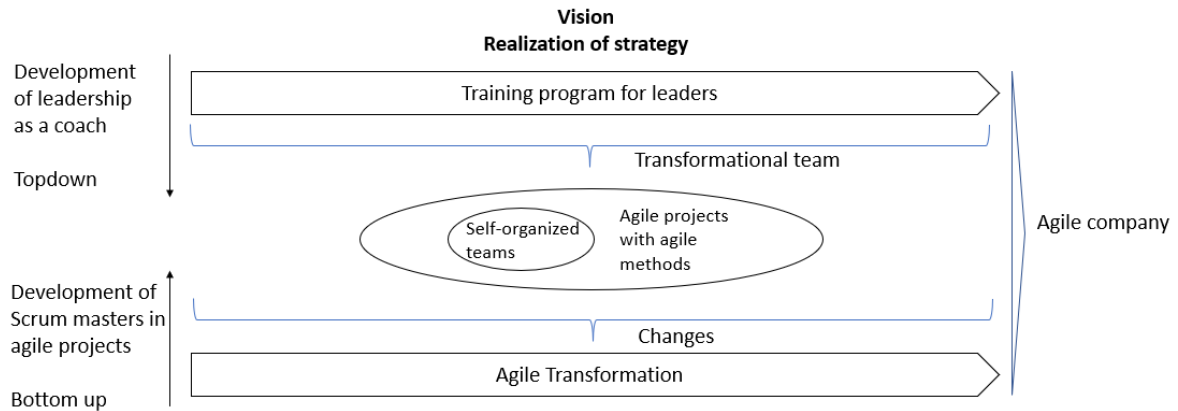


Figure 22: Conceptual model for companies

Source: Author's illustration

Before the companies start with agile approach a vision should be created. A vision gives all employees a direction and main course how the company wants to be and what kind of values should be implemented in the company. The strategy can be derived from the vision and thus provides concrete steps for action that need a realization. The realization includes a training program for leaders. Top-down leaders are trained as coaches. The leaders and employees can create a transformational team that acts in a cross functional way over the company and identify fields for agile improvement and support the agile transformation.

Self-organized teams work in agile projects and with agile methods. Bottom up there is a development of Scrum masters who steer and support the projects and have huge agile work practice. The changes that arise in the project flow contribute to the agile transformation process.

If the individual areas described interlock and work together to achieve the agile transformation, then this model can work in companies and serve as a compass.

Conclusions

1. In scientific literature, there is no clear definition of agile transformation. Agile transformation itself is discussed in literature but not in a structured and comprehensive way. Further, there exists no clear definition and measurable characteristics of agile transformation.
2. In the scientific literature there is no clear definition and not clear research which type of a leader fits in most appropriate way in the transition phase of agile transformation in companies.
3. After three leadership types of autocratic leader, leader as a coach and servant leader were evaluated even two types have emerged. That of servant leader as a leader was not identified in companies. It leads to the conclusion that in big companies' servant leaders are not yet established and this leader type exists only in theory.
4. A servant leader is still not yet established in big companies where they have a big proportion of functional and hierarchical organization. Since servant leader is a purely agile type of leadership, an assumption can be made that the companies are still in the transition phase and are far from reaching their goal to be completely agile.
5. Based on this result coach as a leader is dominant and significantly more pronounced as an autocratic leader. So, in summary an autocratic leader still exists in the companies but the tendency in correlation to agile transformation goes definitely to coach as a leader.
6. The autocratic leadership in the agile approach and agile way of working is also established. So, in this case it is possible that there is a period of transformation or the agile way of working as a hybrid model of autocratic leadership type. Interesting finding is that there are two answers with the statement that they already giving agile trainings or working as agile coaches and are still near to autocratic leadership.
7. Big companies are in the agile transformation but still have characteristics of autocratic leadership because of decades of functional organization. For this reason, an "island" solution is possible where in specific areas agile approach and agile work practice exists.

8. Autocratic leadership is still necessary in big companies because of the hierarchical structure.
9. Through permanent clarification and adjustment of expectations and requirements agile transformation continue to develop and so does the organization. Employees survey leads to transparency and the decisions of role holders are made on the basis of the results.
10. The answers of respondents in general are alike and positive to agile approach and to the agile experience. In general, agile approach has a positive tendency in companies and is regarded as useful.
11. There is a strong and positive relationship between leadership type and agile transformation. The trend is going to a leader as a coach who supports employees and let them work without strict regulations. The leader as a coach has influence on agile transformation.
12. There is existing a relationship between agile work practice and agile transformation. In this case the higher are agile methods and agile project management established, the higher is a progress of agile transformation.
13. The organizational structures of companies' organizational structures in Germany are still hierarchical. This means there is a clear top-down management approach in the majority of big companies. Consequently, employees think that they do not have the responsibility to make decisions.
14. Corporate culture is based on values. In the context of the change process from "classic" to "agile", it is therefore elementary to define agile values. This creates an awareness of the enormous change process and gives employees and leaders orientation for their actions.
15. The responsibilities are thus shifted to where the expertise is to be found: to the employees. The focus is on the employee as a specialist. This change allows companies to do away with lengthy decision-making processes and coordination loops across several hierarchies and to achieve high flexibility and dynamic adaptation. However, there is a determination about an ongoing process here.

16. The empirical findings have shown that the agile transformation in large companies is not designed for servant leaders who have already firmly established the leadership type of coach. Classical leadership styles are still present in the functional organization and are still necessary.
17. The beginning - and possibly also the end - of agile transformation is the change of the lived understanding of leadership. Agile work practice requires a change in leadership from being a thought leader to being an impulse generator in networks. The bringing together of different types of employees, talents and levels of knowledge develops its own dynamic that cannot be controlled by concrete guidelines.
18. Agile work practice means more and more responsibility for each individual employee to react quickly to mistakes and to changing customer needs. With constructive criticism, employees lose the fear of expanding their own responsibilities.
19. Changes, including the use of agile methods in the company, require the ability to learn - both on the part of employees and leaders and on the part of the organization. Leaders have to exemplify the willingness to change. In addition, leadership means not only limiting oneself to the methodological and business topics but initiating the necessary cultural change with a changed mindset and being open to the challenges that arise.
20. In the agile framework self-managing teams deliver baseload activity and are relatively stable over time. These teams define the best way to set goals, prioritize activities and focus effort.
21. The agile approach and thus agile transformation offer companies a flexible response to crises. These crises occur more frequently in today's world and have become part of daily business. Therefore, the reaction speed is crucial and brings decisive advantage over the competition.
22. Agile transformation not only includes the methods but is more concerned with the new way of "playing". Digitalization has changed the way companies operate and new rules of the "game" have become established. Companies have to "play" with the new rules and agile work practice offer a solution.

23. The agile transformation process creates the appropriate framework because uncertainty is fundamentally at odds with the need for security and predictability. This is also the big difference to the traditional approach: The feeling of security that a plan can provide is eliminated. Instead of security there is a flexible reaction to volatile market.

Suggestions for companies

Suggestions for companies

1. Leaders must be supported by means of appropriate personnel and leadership instruments in discarding their familiar classical behavior and thought patterns, adopting an agile mindset, and learning self-organization and self-responsibility. Training programs for leaders should be developed.
2. When introducing agile concepts, it is advisable to proceed step by step. Pilot project should be started. With the positive experiences from the pilot project, agile working methods are gradually transferred to other areas. Several pilot projects and eventually the whole division should be transformed in an agile way and the rest of the organization should be connected through appropriate intersections and collaboration agreements.
3. A vision should be developed that gives employees in the company a clear direction and creates a common understanding of the long transformation. Based on this process a strong coalition can be created by people from cross levels and cross silos that have the influence needed to lead change.
4. A company should routinely evaluate its processes to identify opportunities for agile improvement. All possible solutions should be explored and brainstormed. The findings and recommendations should be discussed with all company levels and anonymous feedback is in this case important. It is important to consider how each solution will impact the company in a short and long-term.
5. In order to remain viable, companies must not choose one path as a solution and as the only way but allow for different perspectives on realization.
6. Expectations that culture can be changed quickly and can be influenced indirectly should not be considered. Instead, focus on practice and start with methods. The culture can then be influenced indirectly.

Suggestions for middle level leaders

7. There should be like-minded employees who can spread the agile values and methods and thus actively support the agile transformation. For this reason, the pioneers should be picked and established by a leader. The pioneers possessing agile values and bringing agile competence with them should be trained in the company. These pioneers can shape the agile core team and be multipliers in the implementation. This allows the required level of flexibility to continuously adapt and optimize the agile transformation.
8. Agile transformation is not kind of a process that has an exact start and end date without the influence of the environment and the company itself. For this reason, the duration should be clear to every employee. The duration of the agile transformation should be communicated so that there is no expectation that it will be a shorter process.
9. Leaders must be supported by means of appropriate personnel and leadership instruments in discarding their familiar classical behavior and thought patterns, adopting an agile mindset, and learning self-organization and self-responsibility.
10. A leader should be more a coach for the employees, an inspiring leader who strengthens the innovators in their role model function, who then in turn motivate other employees for new ideas or actions. The most important requirement is to give up control and micromanagement as well and to trust the employees and not to execute the autocratic principles.
11. A change project should not be ordered, nor imposed from above. There should be a plan drawn up by leaders for the agile transformation. The direction should be developed, whereas the implementation should be done by the employees themselves.
12. The responsibilities should be shifted to the employees and the focus is on the employee as a specialist. This change allows companies to do away with lengthy decision-making processes and coordination loops across several hierarchies and to achieve high flexibility and dynamic adaptation.

Suggestion for the employees in the project implementation field

13. Feedback should be given especially between employees and leaders. The feedback culture should be characterized by mutual trust and in which employees across hierarchies and functions regularly give each other feedback on their performance, their behavior.
14. The employee should work in a defined sequence and not on several tasks at the same time. Many agile methods require the highest concentration from the participants. Most of the time, there are certain people in the company who, due to their expertise, manage or accompany several projects at the same time. As a result, most of the work is concentrated only on certain employees and does not go beyond that.
15. A community should be built where employees share their experiences about agile working. Some companies are therefore building communities in their organization and supporting their employees in networking. It often helps if employees find a suitable partner among their colleagues for the exchange.
16. A transformational team should be created to support the initiative of the agile transformation and a guiding team to create pilot teams will be needed, a team spread across various areas of the organization, to implement the change and act as a soundboard during the implementation.
17. The employee should be a member of an agile team. For this reason, each employee can empower and support the agile teams. Collaboration and shared decision-making power are very relevant in agile project management and a team decides together what tasks are to be completed and what results are to be achieved.

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APPENDIX

1. Specialist interview in German and English
2. Quantitative survey in German and English
3. Calculation of regression models

Appendix 1. Specialist interview in German and English

Vielen Dank, dass Sie sich Zeit genommen haben. Das Interview verläuft im Rahmen der Dissertation. Insgesamt werden wir max. 120 min Zeit benötigen. Die Fragen sind offen formuliert und erlauben eine Interpretation.

Welche Leadership typen dominieren in ihrem Unternehmen?

Wie würden sie die Führungstypen beschreiben?

Welche Führung verbinden Sie mit dem agilen Ansatz?

Welche Ziele verfolgen die jeweiligen Führungstypen?

Was verstehen Sie unter Agilität?

Nach welchen Kriterien können Sie den Begriff Agilität greifen?

Was verstehen sie unter der agilen Transformation?

An welchen Kriterien halten sie die agile Transformation fest?

Translation:

Thank you very much for your time. The interview is part of the dissertation. We will need a maximum of 120 minutes. The questions are open-ended and allow interpretation.

Which leadership types dominate in your company?

How would you describe the leadership types?

Which leaders do you associate with agile approach?

What goals do the respective leadership types pursue?

What do you understand by agility?

What criteria can you use to grasp the term agility?

What do they understand by agile transformation?

What criteria do they use to define agile transformation?

Translated with www.DeepL.com/Translator (free version)

Appendix 2: Quantitative survey in German and English

Agile Transformation in Unternehmen

Im Rahmen einer wissenschaftlichen Arbeit zum Thema Agile Transformation ist ein Fragebogen erstellt worden, der den Agilen Reifegrad messen soll. Mit diesem Fragebogen möchten wir herausfinden, wie präsent die Agile Philosophie und Agile Methoden sind und welche Rahmenbedingungen für die Agile Umsetzung erforderlich sind. Das Ausfüllen des Fragebogens dauert circa 10 min. Bitte füllen Sie den Fragebogen bis 21. August aus. Ihre Teilnahme an der Umfrage ist freiwillig und in anonymer Form möglich und wird nach geltenden CP-Rundschreiben 15/02 und 21/02 durchgeführt. Wenn Sie in Ihren Antworten freiwillig Angaben zu Ihrer Person machen, werden diese nur für Zwecke der Umfrage und keine anderen Zwecke verwendet. Weitere Informationen zum Schutz Ihrer personenbezogenen Daten finden Sie in der Datenschutzerklärung für Siemens-Mitarbeiter. Ergebnisse werden Ende September vorgestellt und besprochen. Herzlichen Dank für Ihre Hilfe!

1. Seit wie vielen Jahren sind Sie im Unternehmen?

1-5 Jahre

6-10 Jahre

11-15 Jahre

Mehr als 15 Jahre

2. Seit wie vielen Jahren sind Sie in Ihre Rolle

1-5 Jahre

6-10 Jahre

11-15 Jahre

Mehr als 15 Jahre

3. Sind Sie eine Führungskraft?

Ja

Nein

4. Bitte wählen Sie eine passende Option aus:

Die Agile Philosophie und die Methodik sind mir bekannt

Ich habe punktuell nach agilen Elementen/Methoden gearbeitet

Ich habe bereits nach der Agilen Methodik gearbeitet

Ich habe bereits Agile Projekte umgesetzt

Ich gebe Schulungen zu Agilen Themen und fungiere als Coach

5. Agile Methoden sind im Unternehmen bekannt und werden bereits angewendet

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

6. Agiles Projektmanagement ist bereits im Unternehmen etabliert und wird angewendet

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

7. Eine Führungskraft im Unternehmen wirkt bei seinem Führungsstil wie ein "Coach". Der Weg wird eigenständig bestimmt und nur durch Leitplanken der Führungskraft limitiert.

Eine Führungskraft passt die Leitplanken an den Reifegrad des Teams an.

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

8. Eine Führungskraft trifft zentralisiert viele Entscheidungen auch ohne die Zustimmung der Teams.

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

9. Eine Führungskraft passt ihren Führungsstil entsprechend der Situation an. Entscheidungen werden gemeinsam getroffen oder den Teams überlassen.

stimme voll zu

stimme teilweise zu
unentschlossen
stimme teilweise nicht zu
stimme nicht zu

10. Eine Führungskraft ist authentisch, lebt und handelt nach agilen Mindset und Methoden auch in schwierigen Situationen.

stimme voll zu
stimme teilweise zu
unentschlossen
stimme teilweise nicht zu
stimme nicht zu

11. Eine Führungskraft lässt die Mitarbeiter z.B. nach agilen Methoden arbeiten und das Projekt dementsprechend nach der Vorstellung der Mitarbeiter gestalten

stimme voll zu
stimme teilweise zu
unentschlossen
stimme teilweise nicht zu
stimme nicht zu

12. Eine Führungskraft gibt vor wie die Projektumsetzung und -methodik durchgeführt werden soll

stimme voll zu
stimme teilweise zu
unentschlossen
stimme teilweise nicht zu
stimme nicht zu

13. Für wichtige grundlegende Entscheidungen nimmt sich die Führungskraft ausreichend Zeit, um zusammen mit den Teams eine Entscheidung im Konsens zu treffen.

stimme voll zu
stimme teilweise zu
unentschlossen
stimme teilweise nicht zu
stimme nicht zu

14. Eine Führungskraft ist offen für neue Ideen und Vorgehensweisen, die einen positiven Beitrag für den Unternehmenserfolg darstellen. Dementsprechend fördert er die Umsetzung der Ideen.

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

15. Eine Veränderung, die außerhalb meines Verantwortungsbereichs liegt, lässt sich nur schwer realisieren, es kommt zu Hindernissen.

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

16. Die Mitarbeiter verstehen die Veränderung, empfinden sie als sinnvoll und können ihren Beitrag dazu leisten und tragen damit zum Unternehmenserfolg bei.

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

17. Durch die Einführung der agilen Werte und Methoden hat sich die Zusammenarbeit im Team verbessert. Das Handeln im Team wird stärker an Kundenwert ausgerichtet und jeder hilft jedem (kein Silodenken).

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

18. Durch die agile Vorgehensweise hat sich die Effizienz und Effektivität von Besprechungen verbessert

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

19. Die Zielsetzung der agilen Transformation ist verständlich

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

20. Agile Methoden und die agile Arbeitsweise werden als sinnvoll gesehen

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

21. Sie können die agile Transformation aktiv mitgestalten

stimme voll zu

stimme teilweise zu

unentschlossen

stimme teilweise nicht zu

stimme nicht zu

Sonstiges

English translation of the questionnaire:

Agile transformation in companies

As part of a scientific work on the subject of agile transformation, a questionnaire was created to measure the agility. With this questionnaire we would like to find out how present the agile philosophy and agile methods are and what framework conditions are required for agile implementation. Filling out the questionnaire takes about 10 minutes.

Please fill out the questionnaire by August 21st. Your participation in the survey is voluntary and possible in an anonymous form.

Thank you for your help!

1. How many years have you been with the company?
 - 1-5 years
 - 6-10 years
 - 11-15 years
 - More than 15 years
2. How many years have you been in your role?
 - 1-5 years
 - 6-10 years
 - 11-15 years
 - More than 15 years
3. Are you in a manager position?
 - Yes
 - No
4. Please select a suitable option:
 - I am familiar with the agile philosophy and methodology
 - I worked selectively in reference to agile elements / methods
 - I have already worked with the agile methods
 - I have already implemented agile projects
 - I give training on agile topics and act as a coach
5. Agile methods are known in the company and are already in use.
 - totally agree
 - partially agree
 - undecided
 - partially disagree
 - do not agree
6. Agile project management is already established in the company and is being used
 - totally agree
 - partially agree
 - undecided
 - partially disagree
 - do not agree
7. A manager in the company acts like a "coach" with his leadership style. The path is determined independently and only limited by the manager's guard rails. A manager adapts the guard rails to the maturity level of the team.

totally agree
partially agree
undecided
partially disagree
do not agree

8. A manager makes many decisions in a centralized manner, even without the approval of the teams.

totally agree
partially agree
undecided
partially disagree
do not agree

9. A manager adapts their leadership style according to the situation. Decisions are made together or left to the teams.

totally agree
partially agree
undecided
partially disagree
do not agree

10. A manager is authentic, lives and acts according to an agile mindset and methods, even in difficult situations.

totally agree
partially agree
undecided
partially disagree
do not agree

11. A manager lets the employees e.g., work according to agile methods and the project according to the ideas of the employees

totally agree
partially agree
undecided
partially disagree

do not agree

12. A manager specifies how the project implementation and methodology should be carried out

totally agree

partially agree

undecided

partially disagree

do not agree

13. For important fundamental decisions, the manager takes enough time to make a decision together with the teams by consensus.

totally agree

partially agree

undecided

partially disagree

do not agree

14. A manager is open to new ideas and approaches that make a positive contribution to the company's success. Accordingly, it promotes the implementation of the ideas.

totally agree

partially agree

undecided

partially disagree

do not agree

15. A change that is outside of my area of responsibility is difficult to implement; obstacles arise.

totally agree

partially agree

undecided

partially disagree

do not agree

16. The employees understand the change, find it useful and can make their contribution and thus contribute to the company's success.

totally agree

partially agree
undecided
partially disagree
do not agree

17. The introduction of agile values and methods has improved team collaboration. The actions in the team are geared more towards customer value and employees help each other (no silo thinking).

totally agree
partially agree
undecided
partially disagree
do not agree

18. The agile approach has improved the efficiency and effectiveness of meetings

totally agree
partially agree
undecided
partially disagree
do not agree

19. The goal of agile transformation is understandable

totally agree
partially agree
undecided
partially disagree
do not agree

20. Agile methods and the agile way of working are seen as useful

totally agree
partially agree
undecided
partially disagree
do not agree

21. You can actively help shape the agile transformation

totally agree

- partially agree
- undecided
- partially disagree
- do not agree

Appendix 3: Results of regression models

* Regressionsmodels.

REGRESSION/STATISTICS COEFF CI (95) R /CRITERIA=PIN (.05) POUT(.10)
/NOORIGIN /DEPENDENT v1 v2 v11 TO v17/METHOD=ENTER culture time1 time2.

Regression

Dependent Variable: v1 Agile methods are known in the company and are already being applied
Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been in the company? ^b		Enter

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,391	0,403		3,453	0,001
	culture Leadership culture	0,702	0,103	0,559	6,792	0,000
	time1 How many years have you been with the company?	-0,047	0,084	-0,052	-0,565	0,573
	time2 For how many years have you been in your role	0,029	0,119	0,022	0,247	0,806

- a. Dependent Variable: v1 Agile methods are known in the company and are already being applied

Dependent Variable: v2 Agile project management is already established in the company and is applied.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
-------	-------------------	-------------------	--------

1	time2 For how many years have you been in your role, culture Leadership culture, time1 For how many years have you been in the company? ^b		Enter
---	--	--	-------

- a. Dependent Variable: v2 Agile project management is already established in the company and is applied
- b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,461 ^a	0,213	0,190	1,118

- a. Predictors: (Constant), time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been with the company?

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,158	0,483		2,399	0,018
	culture Leadership culture	0,658	0,124	0,466	5,315	0,000
	time1 How many years have you been with the company?	-0,154	0,101	-0,149	-1,527	0,130
	time2 For how many years have you been in your role?	0,135	0,142	0,092	0,950	0,344

- a. Dependent Variable: v2 Agile project management is already established in the company and is applied

Dependent Variable: v11 It is difficult to implement a change that is outside my area of responsibility; obstacles arise.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	time2 For how many years have you been in your role, culture Leadership culture, time1 For how many years have you been in the company? ^b		Enter

- a. Dependent Variable: v11 It is difficult to implement a change that is outside my area of responsibility; obstacles arise.
- b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,556 ^a	0,309	0,290	1,016

- a. Predictors: (Constant), time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been with the company?

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant) How many years have you been with the company?	6,202	0,439		14,131	0,000
	culture Leadership culture	-0,770	0,113	-0,561	-6,840	0,000
	time1	0,045	0,091	0,045	0,491	0,624
	time2 For how many years have you been in your role?	0,010	0,129	0,007	0,075	0,940

- a. Dependent Variable: v11 It is difficult to implement a change that is outside my area of responsibility; obstacles arise.

Dependent Variable: v12 Employees understand the change, perceive it as meaningful and can make their contribution to it, thus contributing to the company's success.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	time2 For how many years have you been in your role, culture Leadership culture, time1 For how many years have you been in the company? ^b		Enter

- a. Dependent Variable: v12 For how many years have you been in your role, culture Leadership culture, time1 For how many years have you been in the company.
- b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,541 ^a	0,293	0,273	0,807

- a. Predictors: (Constant), time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been with the company?

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,104	0,349		6,035	0,000
	culture Leadership culture	0,562	0,089	0,522	6,291	0,000
	time1 How many years have you been with the company?	-0,229	0,073	-0,293	-3,159	0,002
	time2 For how many years have you been in your role	0,110	0,103	0,098	1,074	0,285

- a. Dependent Variable: v12 Employees understand the change, perceive it as meaningful and can make their contribution to it, thus contributing to the company's success.

Dependent Variable: v13 The introduction of agile values and methods has improved teamwork. The team's actions are more strongly aligned with customer value and everyone helps everyone else (no silo thinking).

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method

1	time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been in the company? ^b		Enter
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- a. Dependent Variable: v13 The introduction of agile values and methods has improved teamwork. The team's actions are more strongly aligned with customer value and everyone helps everyone else (no silo thinking).
- b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,334 ^a	0,112	0,087	1,053

- a. Predictors: (Constant), time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been with the company?

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,395	0,455		5,265	0,000
	culture Leadership culture	0,424	0,117	0,338	3,634	0,000
	time1 How many years have you been with the company?	-0,027	0,095	-0,029	-0,284	0,777
	time2 For how many years have you been in your role	0,016	0,134	0,012	0,121	0,904

Dependent Variable: v14 Agile approach has improved the efficiency and effectiveness of meetings.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	time2 For how many years have you been in your role, culture Leadership culture, time1		Enter

	For how many years have you been in the company? ^b		
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- a. Dependent Variable: v14 Agile approach has improved efficiency and effectiveness of consultations.
- b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,254 ^a	0,064	0,038	1,216

- a. Predictors: (Constant), time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been with the company?

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,679	0,525		5,103	0,000
	culture Leadership culture	0,295	0,135	0,209	2,190	0,031
	time1 How many years have you been with the company?	0,052	0,109	0,051	0,475	0,636
	time2 For how many years have you been in your role?	-0,212	0,155	-0,144	-1,373	0,173

- a. Dependent Variable: v14 Agile approach has improved efficiency and effectiveness of consultations

Dependent Variable: v15 The objective of agile transformation is understandable

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been with the company? ^b		Enter

- a. Dependent Variable: v15 The objective of agile transformation is understandable.
- b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,639 ^a	0,408	0,391	0,805

- a. Predictors: (Constant), time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been with the company?

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,019	0,347		2,933	0,004
	culture Leadership culture	0,678	0,089	0,579	7,611	0,000
	time1 How many years have you been with the company?	0,176	0,072	0,206	2,430	0,017
	time2 For how many years have you been in your role	-0,094	0,102	-0,077	-0,916	0,362

- a. Dependent Variable: v15 The objective of agile transformation is understandable

Dependent Variable: v16 Agile methods and the agile way of working are seen as useful

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been in the company? ^b		Enter

- a. Dependent Variable: v16 Agile methods and the agile way of working are seen as useful

- b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,281 ^a	0,079	0,053	0,872

- a. Predictors: (Constant), time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been with the company?

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,803	0,376		7,444	0,000
	culture Leadership culture	0,275	0,097	0,270	2,846	0,005
	time1 How many years have you been with the company?	0,002	0,078	0,002	0,021	0,983
	time2 For how many years have you been in your role	0,082	0,111	0,077	0,743	0,459

- a. Dependent Variable: v16 Agile methods and the agile way of working are seen as useful
 Dependent Variable: v17 You can actively shape the agile transformation

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	time For how many years have you been in your role, culture Leadership culture, time1 For how many years have you been in the company? ^b		Enter

- a. Dependent Variable: v17 a. You can actively shape the agile transformation
 b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,601 ^a	0,361	0,343	0,807

- a. Predictors: (Constant), time2 How many years have you been in your role, culture Leadership culture, time1 How many years have you been with the company?

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,462	0,348		4,197	0,000
	culture Leadership culture	0,562	0,089	0,497	6,291	0,000
	time1 How many years have you been with the company?	0,206	0,073	0,250	2,841	0,005
	time2 For how many years have you been in your role	0,052	0,103	0,044	0,510	0,611

a. Dependent Variable: v17 You can actively shape the agile transformation