EMPIRICAL EVALUATION OF THE IMPACT OF LEADERSHIP TYPE IN A PROCESS OF AGILE TRANSFORMATION

NURGUL JANOWSKI

Faculty of Business, Management and Economics,
University of Latvia, Riga, Latvia

Abstract

The aim of this article is to investigate the dependency of leadership type, especially the leadership behaviour, to the process of agile transformation. Main hypothesis which is to be proved in this article: Leadership type influences the agile transformation. To ensure the agile transformation, the most important factor leadership type must be agile aligned and serve as the driving power in the agile transformation process.

Keywords: Leadership type, agile transformation, dependency model, coach as a leader, autocratic leader, servant leader

INTRODUCTION

Traditional organisations are not designed for the dynamic development of the changing economy, but the company's ability to change becomes a critical success factor. Agility gives the companies to act and react flexibly 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.

The existing lifecycle of products is shortening and based on customer requirements also changed. Companies have to act flexible just to stay in the market. This recent development is caused by an increasing cost pressure and increasing need to act faster, smarter and still keep the best quality.

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

Leadership is a very important part for the agile transformation in companies and plays the main role in its implementation and cares also for the 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 by agile implementation.

In this article, the author limits themselves to the empirical presentation, on presenting the results of qualitative and quantitative research. Theoretical research is not the focus of the article.

DEFINITION OF LEADERSHIP TYPE AND AGILE TRANSFORMATION BY QUALITATIVE RESEARCH

Leadership type according to the literature research is in this sense an inward-looking mission of leading companies. Also according to the statements of the specialist interviewers, 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 what are necessary to be a leader
- The relationship between leaders and those they lead is important. Here, the embedding of leadership in the company's culture is crucial
- Leadership is understood as a process that does not have to be linked to individual persons with fixed role assignments

In a framework of qualitative research was done semi-structured specialist interviews. So the interviews are in 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.[1]

The selection of research categories, so to the respondents, based on their considerations falls on different actors who play a role in the environment. The main respondents are employees in companies that are working in leading positions in projects or in their departments and 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 R&D.

According to the specialists, leadership also takes place in contexts in which hierarchies are not defined in advance, but leadership has responsibility for the success of the project or for several tasks in the company and is constantly readjusted in the process. The results of the interviews have limited the existing leadership types to main three types that are occurring in companies in connection with agile transformation: Autocratic leader, coach as a leader and servant as a leader.

The authoritarian type of leadership can still be seen 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

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

global strategic projects, the decision is made in this way. This style is particularly appropriate in crisis or emergency situations, as quick decisions are usually necessary in such situations.

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 they are adhered 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.

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 employees' work. This type of leadership is especially 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 really 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. There are according to specialist interviews 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 is arise from agile working
- Autocratic leader → Leader who behaves opposite of a coach. The behaviour and the mindset of a leader who decide and control is still common in organisation.
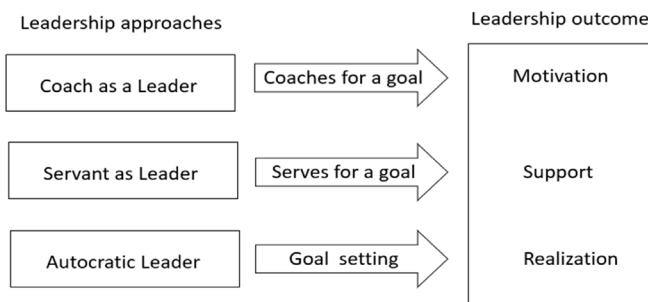- After the specialist interviews the following matrix arise:

Figure 1. **Leadership matrix developed after specialist interview evaluation**
Source: Author's illustration

In Figure 1 above are three leadership types and their motivation / initiation to act. 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.

The term agile transformation has different definitions, and in every company, the agile transformation can be also realised 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. 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 realising the strategy, new ideas and their key performance indicators (KPI) 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 organisation. 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 organisation,
- collaboration between employees,
- willingness to change.

DEPENDENCY MODEL BETWEEN LEADERSHIP TYPE AND AGILE TRANSFORMATION

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

Consequently, this research aims to answer the question whether there is a relation between involving leaders 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.

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 data Saunders[2]. For this reason, a questionnaire was developed. In this case the research design is the basis of any scientific investigation in fields of work. So, for this reason there are basically two research approaches what was used in this thesis: Correlative and experimental studies[3].

Qualitative and quantitative approaches are not regarded here as disparities[4] but rather as complementary in their relationship, because they are each particularly suitable for research into different areas. These two approaches were used in this article. 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 sought[5].
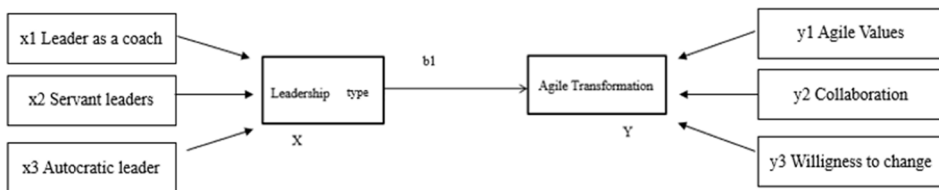
x: leadership type y: agile transformation; this is the main version of the final research dependency model. All variables are defined to make them measurable. At the first step b1 means, that there is a correlation from leadership type to agile transformation.

Figure 2. **Dependency model**

Source: Author's illustration

QUANTITATIVE RESEARCH

Definition of dimensions for measurable criteria for agile transformation was established and a measurable way of the leadership type were selected. In

[2]   Saunders, M.; Lewis, P.; Thornhill, A.: *Research Methods for Business Students*. Pearson Education Limited, 5th ed., 2009, p. 146.

[3]   Creswell, J. W.: *Research design: Qualitative, quantitative, and mixed methods approaches*. Los Angeles: Sage, 2009.
Bryman, A., & Bell, E.: *Business research methods*. 2nd ed. Oxford University Press, 2011.

[4]   Cropley, D. H., & Cropley, A. J.: Engineering creativity: A systems concept of functional creativity. In J. C. Kaufman & J. Baer (eds.), *Faces of the muse: How people think, work and act creatively in diverse domains* (pp. 169–185). Hillsdale, NJ: Lawrence Erlbaum, 2005, p. 8.

[5]   Gläser, J. & Laudel, G.: Experteninterviews und qualitative Inhaltsanalyse (4. Aufl.). Wiesbaden: VS Verlag für Sozialwissenschaften, 2010, p. 25.

the selection the leadership type was established and delimited to three leadership types.

The developed questionnaire is structured in a general section with personal questions and questions about the agile experience supported by three main questions. To explore the role of various working persons in a project way, it was necessary to put questions to wide sample of people employed in companies.

The respondents are asked for their individual opinion. They can specify their level of agreement or disagreements 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.

Descriptive statistics were used at this point. The sample size in total is 111 completed questionnaires of which most of them are employees and 32 are leaders. Due to a high number of missing values answers, one dataset fall was excluded from analysis because of some missing answers. Two answer dataset 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 criteria for selection of taking part in the quantitative research are combination of following three criteria:
1) employee have to work in departments, administration areas,
2) in a company with a number if employee over 48.000,
3) experience with classic and agile approach.

RESULTS OF FACTOR ANALYSIS

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 manifest variables. The discovery of these mutually independent variables or characteristics is the point of the data-reducing (also dimension-reducing) method of factor analysis[6].

Exploratory factor analysis by principal axis factoring with oblique rotation, following the recommendations of Costello & Osborne[7] was 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.

Following the eigenvalue criterion, a one factor solution fits the data (see scree plot). The first eigenvalue was 4.61, the eigenvalue of the second was 0.85.

[6]   Costello, A. D., Soboren, J. W.: Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most from You Analysis, Practical Assessment, Research & Evaluation, Volume 10 Number 7, July 2005.
[7]   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), 1–9, 2005.
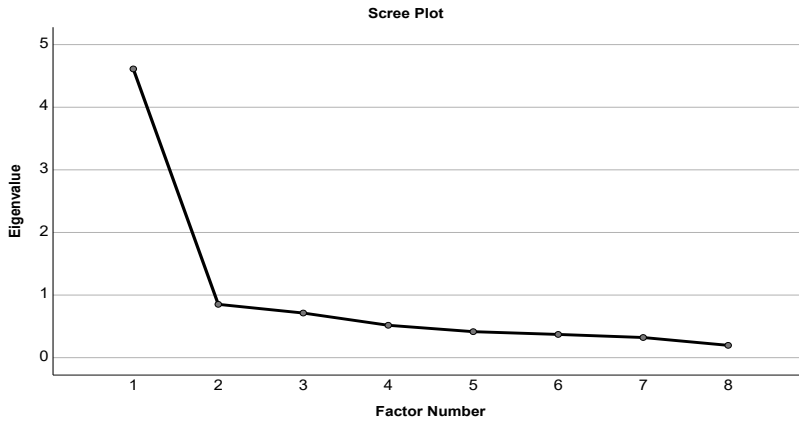
Figure 3. **Scree plot**

The scree plot shows that the first four factors explain most of the total scatter in the data (indicated by the eigenvalues). The eigenvalues of the first four factors are all greater than 1. The remaining factors explain a very small proportion of the scatter and are probably unimportant.

Following the eigenvalue criterion, the eight variables in the table 8 forms the variable: "Leadership type". This factor explained 58 percent of the variance of all items.

Table 1

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

All factor loadings are acceptable, only the loading of v8 was rather low with -0.43. The squared factor loading describes the part of the variance of the item that is explained by the factor. This value ranges from 67 % for item v5 to 18 % for item v8. As could be expected, given the wording of the items, v4 and v8 had negative loadings in contrast to all other items with positive loadings. After recoding of v4 and v8, 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 v8 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 variables v3-v10 for every person. 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 style. 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.
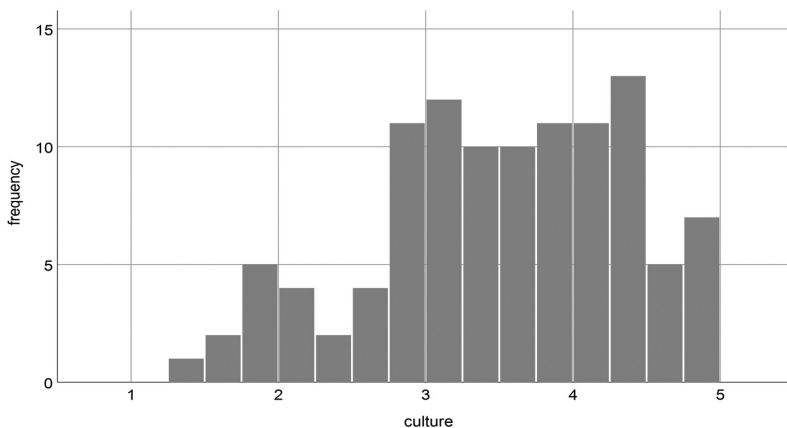

Figure 4. **Histogram of predictor variable "type" by measuring from extreme autocratic (1) to extreme coach (5)**

The histogram measures the leadership behaviours in companies.
Y axis: On the frequency site there are the number of answers, in total 110.

X axis: By type is measured "Leadership type" from 1 to 5. 1 means "extreme autocratic" and 5 means "extreme coach"
Here, the predominant distribution on the scale of 3 to 5 becomes apparent. Based on this result coach as a leader is dominant und significantly more pronounced.

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.
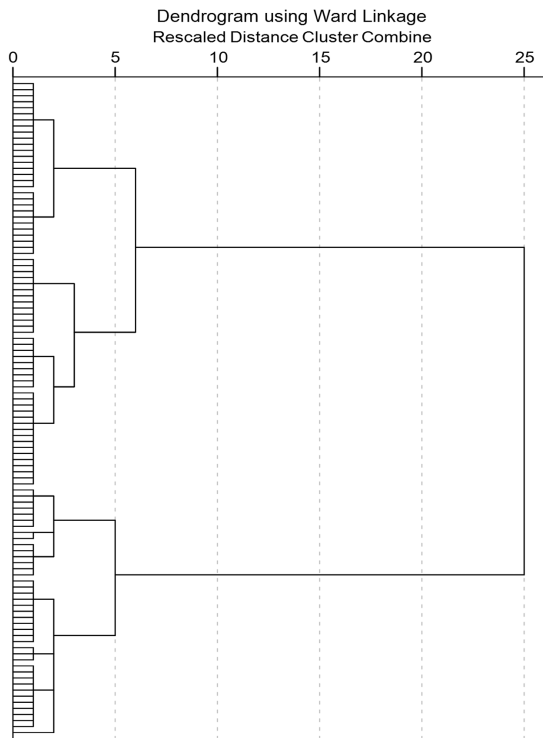

Figure 5. **Cluster analysis: Dendrogram using Ward Linkage. Rescaled Distance cluster combine**

The dendrogram is a tree diagram used to visualise 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 tree leadership styles visible in our data.

However, the result of the cluster analysis is very clear: Only two groups can be identified: coach as a leader and autocratic leader. An interesting finding is included in the following Table 2:

<div align="right">Table 2</div>

Crosstabulation of variables about agile experience

Leadership types	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%

In the summary 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 the agile transformation but still have characteristics of autocratic leadership because of decades of functional organisation. For this reason there is possible an "island" solution where in specific areas agile approach and agile culture is existing.

CONCLUSION

After three leadership types were evaluated even two types have emerged. That servant leader is not shown what leads to the conclusion that in big companies a servant leaders is not yet established and this leader type existing only in the theory. A servant leader is still not yet established in big companies where they have a big proportion of functional and hierarchical organisation. Since servant leader is a purely agile type of leadership, there can be done an assumption that the companies are still in the transition phase and are far from reaching their goal to be completely agile.

Based on this result coach as a leader is dominant und significantly more pronounced as autocratic leader. So in summary autocratic leader is still existing

in the company but the tendency in correlation to agile transformation goes definitely to coach as a leader.

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 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.

In conclusion 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 the correlation of agility and agile transformation and the direct correlation to agile transformation.

It requires changes in attitude and behaviour 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 agility. 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 agility, it is above all company leaders that is crucial. Leader needs a lot of courage and foresight to start a change early enough.

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