Technical University of Vienna
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A Descriptive Evaluation of the Value Chain Model for Team Performance

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Abstract

In today's complex and fast-paced organizational environments, leaders face the challenge of managing numerous interrelated factors that influence team performance, ranging from setting clear and accepted goals to establishing defined roles and fostering trust and psychological safety. Given the difficulty of maintaining oversight of all these factors, there is a growing need for comprehensive models that offer cognitive guidance and enable performance measurement. This thesis examines whether the Value Chain Model addresses this need and how it compares to existing models, with a particular focus on its performance dimensions. The analysis explores the model's fit with its intended purpose (user purpose–model fit) and alignment with performance goals (target system–model fit), based on theoretical considerations and quantitative descriptive methods.

The investigation into the user purpose–model fit reveals that, compared to older models, the Value Chain Model holds strong potential as a leadership tool for analyzing and improving team performance. This is primarily due to its inclusion of a broad range of performance factors and its explicit integration of leadership aspects, which are often neglected in other frameworks. Moreover, by foregoing a rigid, sequential phase model, it offers greater practical flexibility, reflecting the real-world challenge of addressing multiple performance factors simultaneously. At the same time, it neglects complex interrelationships in favor of improved cognitive accessibility and practical usability.

With regard to the target system–model fit, the results were mixed. While some data strongly supported the hypotheses, issues with data quality and contextual limitations introduced contradictions that ultimately led to a more cautious interpretation. Overall, the three hypotheses remain inconclusive, though some findings indicate partial support. This highlights the model's potential and the need for further empirical testing under more controlled conditions.

Acknowledgements

I would like to express my sincere gratitude to everyone who supported me throughout the process of writing this thesis.

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Contents

Chapter 1

Introduction

Within organizations, teams are often the foundation for addressing the complex challenges that must be overcome to remain competitive (A. Edmondson, 1999, p. 350), (Morgeson et al., 2010, p. 5). This is largely independent of the sector in which an organization operates. From the military, to healthcare, to aviation, to engineering projects, teams are used everywhere, especially when the complexity of a task increases (Salas, Cooke, & Rosen, 2008, p. 544).
In the context of teams and organizations, the phenomenon of "leadership" usually occurs (Patejczyk & Kobos, 2022, p. 238). It is common for one person within a team to assume a leadership role and take responsibility for ensuring that the team's goals are achieved as effectively as possible (Zaccaro et al., 2001, p. 452).

However, the activities a leader must carry out to meet the needs of their team in varying situations are by no means trivial. There is a wide range of indicators that a leader can influence that can have an impact on team performance.
These indicators include a clear and commonly accepted goal and the skills needed to achieve that goal (Iorhen, 2019, pp. 19–20). A clear distribution of roles and assigned responsibilities among team members is also essential for performance (Dina, 2010, p. 49). The meaning that a team member individually attaches to the team goal is a key motivational factor for team performance (Flood & Klausner, 2018, pp. 2–3). An indicator that is also critical to performance is the trust that team members have in each other (Flood & Klausner, 2018, p. 1090). One factor that is particularly important in a dynamic market environment is innovation and creative ideas to stay competitive (Iorhen, 2019, p. 19).
These are just a few of the many factors that influence team performance that are within the control of leaders. As a leader, it can be difficult to understand exactly what needs to be considered to create team performance. It is also easy to lose track of all these factors in the hectic pace of daily work. To address this situation, models are being developed that enable a more differentiated understanding of the team performance system and, in a further step, enable team performance to be measured.

Such a team performance model can be the so-called "Value Chain Model" (Güttel et al., 2024). This model aims to provide a holistic view of team performance from a leadership perspective.

The purpose of this thesis is to evaluate whether the Value Chain Model effectively addresses the challenges described and serves as a practical framework for leaders in their hectic daily work of creating a high performing team.
Therefore, this thesis takes a look at team performance factors and team performance models and compares them on a theoretical basis. In addition, an empirical test of the Value Chain Model will be conducted to explore its capabilities.

Chapter 2

Modeling a System

This chapter provides a brief overview of model theory. It evaluates how a model is viewed in this thesis and what determines the quality of a model. This lays the foundation for the analysis of models later on.

2.1 Model Theory

2.1.1 What Is a Model?

If one were to ask what someone understands by the term "model," the answer might go something like this: "A model is an attempt to be an image of reality." Who would have thought that asking the same question to science would lead to a debate that is still ongoing today? Depending on the branch of science consulted, the answers can be quite different (Braun & Saam, 2015, pp. 16–17).

At a basic level, models can take the form of physical objects such as Watson and Crick's metal model of DNA, or exist purely in the imagination, as in the case of the perfect market, which requires no material representation to fulfill its explanatory function (Braun & Saam, 2015, p. 16).

Following the philosophical path, models can be viewed somewhat differently from a syntactic or semantic perspective (Kautek et al., 2022, pp. 18–19). In the traditional syntactic view, theories were regarded as sets of logically-deductively linked propositions (Kautek et al., 2022, p. 18). In this context, a model served to facilitate the interpretation of a formal calculus. It thus provided a consistent interpretation of theoretical statements (Kautek et al., 2022, p. 18). The semantic view sees theories and models not as linguistic constructs but as abstract structures. These structures satisfy certain theoretical assumptions and are related to the real world. Models are not just interpretations or applications of a theory, but represent specific aspects of reality (Kautek et al., 2022, p. 19). However, the idea that models always represent a clearly definable part of reality is complicated by various scientific applications. One example is counterfactual reasoning, where there is no real

subset that the model could represent (Kautek et al., 2022, p. 20).

What many of these views have in common is that a model represents something. This opens up the discussion of representation, and the crux of how a model can effectively represent something when it misrepresents it (Knuuttila, 2011, p. 270). Models typically embody idealizations, simplifications, approximations, and fictional elements (Knuuttila, 2011, p. 270). Rather than viewing misrepresentation in models as a flaw, one might focus on the intent behind it and the potential cognitive benefits it offers, recognizing that intentional inaccuracies in models can serve as valuable tools for understanding (Knuuttila, 2011, p. 270).
Consequently Knuuttila (2011) views, models as epistemic tools, a triangular relationship between model, target system, and user. In this framework, greater emphasis is placed on the process of constructing scientific models (Kautek et al., 2022, p. 21). This process not only establishes a connection to the target system, but also ensures that the model, in its specific application, effectively serves as a tool for the user to extract knowledge about the target system (Kautek et al., 2022, p. 21).

The final approach to emphasizing what a model is will be the tone of this master's thesis, because it is a perspective that is appealing to the idea that a model has a purpose to serve, as opposed to being a perfect representation of an effect or thing to be described in the real world. Regarding the purpose of this thesis, why would anyone want a model that perfectly captures all the factors and relationships involved in team performance if it is so complicated that no useful benefit can be derived from it?

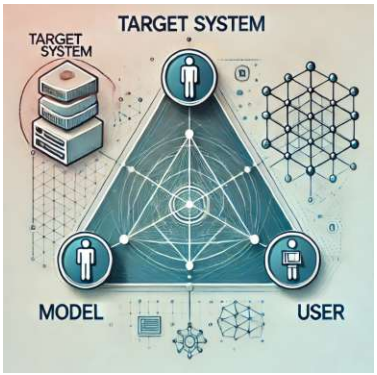

Figure 2.1: Triangular relationship between model, target system, and user. Illustration generated using DALL · E.

2.1.2 What Determines the Quality of a Model - Which One Is the Right One?

The motto here should be to make the model as simple as possible and as complex as necessary (Neunzert & Prätzel-Wolters, 2014, p. 41). To understand this relationship and how the quality of a model is determined, one must look at the target system and how it is connected to a model. From a technical and scientific point of view, the target system is usually an input/output system (Neunzert & Prätzel-Wolters, 2014, p. 41). For example, the wind blows at a wind turbine and the rotation of the turbine generates electricity. The wind, in terms of the kinetic energy it brings in the form of mass transport, is the input and the output is the energy generated by the turbine in the form of electricity.

To describe the current state of a system, "state variables" are needed (Neunzert & Prätzel-Wolters, 2014, p. 41). In addition to state variables, "parameters" may be needed to distinguish between similarly structured systems. Returning to the wind turbine example, state variables would be wind speed, blade angle, or rotor speed. Parameters could be the blade length, the gear ratio, or some aerodynamic property of the blades. Therefore, the state variables change over time, but the parameters do not. If it is the case that there are scientific laws that describe the changes in system states, then all parameters have geometric, physical, or chemical meaning (Neunzert & Prätzel-Wolters, 2014, p. 42). Therefore, they are measurable. If these laws, in the form of equations, can be solved well numerically, the input/output system can be simulated (Neunzert & Prätzel-Wolters, 2014, p. 42).

Another application of modeling is often to optimize the system. This usually requires many iterations to see which parameters need to be changed to achieve an optimum of the system. In this example, the blade length and height of the wind turbine can be varied at a given wind speed to examine the resulting electrical energy gains. The interesting part here is that optimizing the system often requires simplifying the model (Neunzert & Prätzel-Wolters, 2014, p. 42). This leads to a representation of the system that is different from the real system. The reason for this is the need to shorten the simulation time, which is longer when the equations are harder to solve.

An example can be seen in the Figure 2.2. Here, the model for calculating the equations for determining the deformation at a given force acting on the mechanical part is represented by the mesh on the surface of the part. The finer the mesh, the more realistic the model in the corners of the part, but the simulation would take longer.

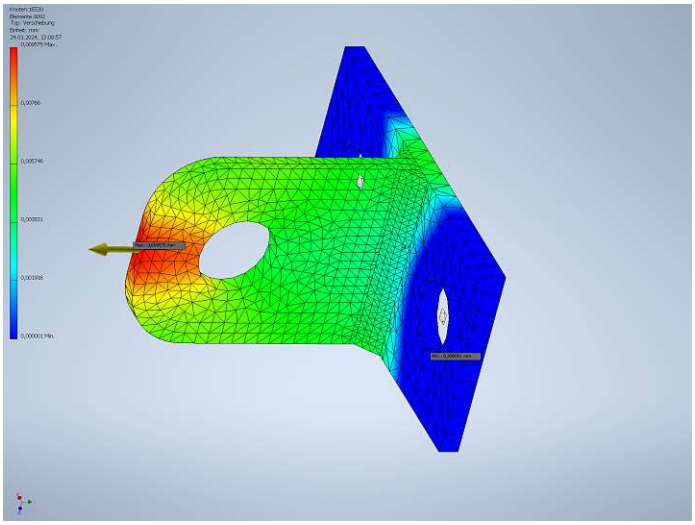

Figure 2.2: Simulation of the deformation of a mechanical part. Own illustration.

By combining these findings with the definition of a model presented in Section 2.1, the following requirements for a model can be synthesized:

- The model should represent the desired target system to a decent extent (fit between the target system and model).
- The model should be useful for the purpose the user wants it to be (fit between user purpose and model).

The extent to which these requirements are fulfilled determines the quality of a model. When considering team performance as a system, it is important to recognize that it constitutes a socio-technical system. Therefore, it is by no means trivial. It is not easy to distinguish between parameters and state variables, and even measuring them is not as straightforward as for factors that have physical meanings.
Regarding the first aspect of this thesis (fit between target system and model), the target system would be team performance. For simplicity, consider a team consisting of a fixed leader and a constant number of team members. The roles within the team remain unchanged, as do technical aspects such as the equipment available for task performance. In this case, parameters include the number of team members, the role assigned to each member, and the technical equipment allocated to them. In contrast, state variables refer to factors that are more likely to change over shorter time periods, such as motivational state, team cohesion, or workload.
Compared to reality, this example is far from realistic because the composition

of the team members would also change over time, as would the leader and other factors such as the technical equipment. Therefore, it is not easy to define the parameters or state variables of the system. As a result, one could even argue that in the case of team performance, there are no "real parameters" and only state variables. This is how the system is viewed in this thesis. This results in a system where team performance serves as output, and a set of state variables characterizes the system, which is represented by a model.
When evaluating a model that claims to accurately represent the target system, it is essential to ensure that the model neither underfits nor overfits the data. Underfitting occurs when the model is too simplistic and does not represent the system realistically enough (too few predictors are included in the model, as shown in Figure 2.3) (Montesinos López et al., 2022, p. 109). Overfitting occurs when a model or system is overly tailored to the specific data or conditions with which it was designed, capturing both the meaningful patterns and the irrelevant details or noise, as shown in Figure 2.3 (Montesinos López et al., 2022, p. 109). This overfitting results in strong performance in the familiar context, but poor generalization to new or unseen situations (Montesinos López et al., 2022, p. 109). Overfitting is also more likely in complex models or systems with high flexibility and can be mitigated by introducing constraints or simplifications to improve robustness and adaptability (Montesinos López et al., 2022, p. 109).

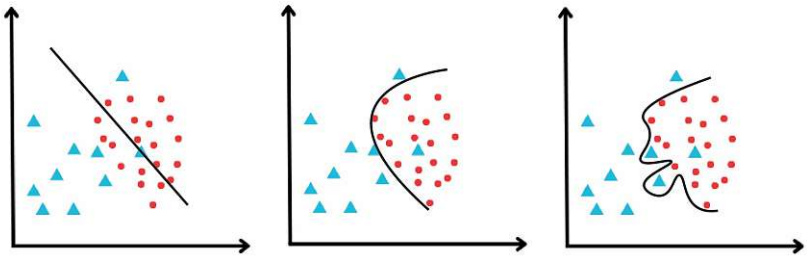

Figure 2.3: Left: Underfitting, middle: appropriate fitting, right: overfitting. Own illustration based on Montesinos López et al. (2022, p. 110).

Another factor worth mentioning about models in general is the balance between prediction accuracy and interpretability. Typically, more complex models (flexible models) are better in terms of accuracy, while simpler models (inflexible models) are better in terms of interpretability (Montesinos López et al., 2022, p. 111). Interpretability refers to the extent to which the model supports human understanding of natural phenomena (Montesinos López et al., 2022, p. 111). Therefore, interpretability belongs to the second aspect (fit between user purpose and model) mentioned above.

When it comes to the level of complexity of a model, this strongly influences the bias and variance of a model, which are also important factors to consider (Montesinos López et al., 2022, p. 111). The bias of a model reflects the degree to which the model simplifies the system it represents, leading to a systematic mismatch between the expected predictions of the model and the true values. Increasing complexity, typically by increasing the number of parameters describing a model, decreases bias but increases variance (Montesinos López et al., 2022, p. 111).

To better understand bias and variance in the context of a model, the following examples are provided. The relationship between bias and variance is also illustrated in the Figure 2.4, shown as shooting targets.

Suppose the goal is to measure the average total height of giraffes. Consider a population in which one-third of the giraffes are very tall (exceeding 6 meters), while the remaining two-thirds have a normal height (up to 5 meters). If measurements were taken only from the very tall subgroup and averaged, the resulting estimate would suggest that giraffes are typically over 6 meters tall. Such a conclusion would not accurately reflect the overall population and would introduce significant bias. If this biased estimate were then used as a parameter in a model, the model itself would inherit a high degree of bias.

Now consider an approach where random samples are taken from the entire giraffe population. Due to small sample sizes, the calculated average heights from each sample may vary significantly. For example, one sample may contain mostly very tall giraffes and yield a mean of 6.2 meters, while another sample may contain mostly normal-sized giraffes and yield a mean of 4.8 meters. This variation in sample means reflects high variance. High variance indicates that a model's predictions are unstable because they are highly sensitive to the specific data used during training. Such inconsistency, caused by small or unrepresentative samples, undermines the reliability and generalizability of the model even in the absence of sampling bias.

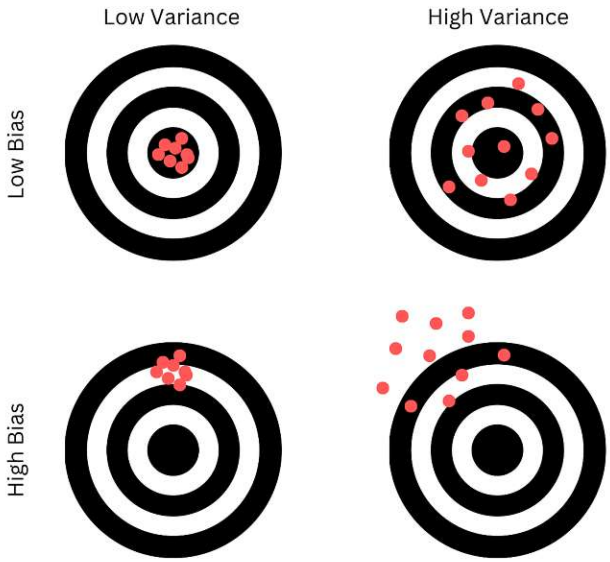

Figure 2.4: Representation of bias and variance. Own illustration based on Montesinos López et al. (2022, p. 112).

In summary, the modeling process involves finding a delicate balance between simplicity and complexity. A model must effectively represent the target system (fit between the target system and model) while also serving the intended purpose of the user (fit between user purpose and model). Achieving this balance often requires careful consideration of trade-offs, such as those between accuracy and interpretability, and between bias and variance.

For socio-technical systems such as team performance, defining parameters and state variables is particularly challenging because these systems are dynamic and multifaceted. Models of such systems must avoid underfitting (oversimplification) and overfitting (over-complexity) to ensure both generalization and usability.

Ultimately, the quality of a model is determined by its ability to capture the essential dynamics of the system while remaining interpretable and practical for the intended application.

Chapter 3

Team Performance

This chapter explains what team performance is and the factors that affect it. Later, the Value Chain Model will be introduced and compared with other models describing team performance. The models will be analyzed based on the extent to which they incorporate factors that influence team performance, as well as their practical applicability, particularly with regard to the cognitive advantages they offer.

3.1 Defining Team Performance

Before discussing the factors that influence team performance, it is necessary to define team performance. This is also important because it provides the subject to measure later in the empirical testing of this thesis.

Team performance is viewed as a broad concept that encompasses multiple outcomes of a team . Such outcomes can include quantitative production, team cohesion, as well as qualitative results (Horwitz & Horwitz, 2007, pp. 990–991). Much of the research has traditionally emphasized measurable operational and quantitative outcomes, such as sales volume or return on equity (Dunphy & Bryant, 1996), although there is growing interest in exploring strategic and qualitative aspects of performance as well (Horwitz & Horwitz, 2007, pp. 990–991). Team performance can be understood according to Horwitz and Horwitz (2007) in terms of team outcomes in three dimensions:

- Quality;
- Quantity;
- Social integration.

A team performance framework based on the principles of input, throughput, and output is also discussed in the literature (Salas, DiazGranados, et al., 2008, p. 906). Inputs are the basic factors that influence team performance before any work begins. Inputs can be (Salas, DiazGranados, et al., 2008, p. 906):

- Individual characteristics (e.g., skills or knowledge);
- Team characteristics (e.g., size, diversity);
- Capabilities and states (e.g., cohesion or readiness).

Throughputs are the processes that occur within the team as it works toward its goals. Key throughputs include (Salas, DiazGranados, et al., 2008, p. 906):

- Communication;
- Coordination;
- Collaboration;
- Decision-making.

Outputs are the results or outcomes of the team's efforts. Outputs are evaluated based on (Salas, DiazGranados, et al., 2008, p. 906):

- Products or services;
- Impact on stakeholders;
- Team growth.

This framework emphasizes that team performance is not only about what is produced (outputs), but also includes the processes (throughputs) and conditions (inputs) that drive success. It also recognizes that team performance unfolds over time, influencing both external results and the internal development of the team and its members.

This perspective on team performance becomes even clearer when illustrated by the following example. If Team A consists of three members and Team B of six, and both achieve the same results, it would be misleading to conclude that their performance is equal. Intuitively, greater credit would be given to Team A, as fewer individuals contributed to achieving the same output, implying a higher level of individual or collective effort. This suggests that team performance should not be assessed solely in terms of output, but should also account for input and throughput.

A broader view of the team performance framework is also offered by Hawkins (2014), including a critique of the flawed traditional measurement approaches. Influenced by heroic leadership and competitive culture, traditional approaches often focus on inputs (e.g., team composition, structures, and processes) or outputs (e.g., goal attainment) (Hawkins, 2014, pp. 3–4). This standpoint may lead to the misguided perception of performance as a static objective to

be attained at a single point in time, whereas it should be understood as a continuously evolving process (Hawkins, 2014, pp. 3–4). In such environments, teams can prioritize outperforming others rather than creating a meaningful and sustainable impact (Hawkins, 2014).

Hawkins (2014, p. 4) proposes a more holistic understanding of team performance, emphasizing its ability to create value for a wide range of stakeholders. This value-driven approach goes beyond internal metrics to consider:

- The organization and its investors;
- Internal and external customers and suppliers;
- The team members themselves, promoting their development and satisfaction;
- The communities in which the team operates;
- The broader "more-than-human" world, including environmental and ecological considerations.

Building on the perspectives discussed, this thesis adopts a comprehensive view of team performance. Team performance should not be judged solely by the outcomes a team produces. Instead, a fairer assessment should also take into account inputs and other influencing factors, recognizing their significant role in shaping performance. Additionally, all types of team outcomes, whether qualitative, quantitative, or related to other aspects, will be considered as contributions to team performance. This perspective acknowledges that even outcomes that do not directly improve performance metrics, such as sales volume, can have a positive long-term impact on the team by fostering growth, cohesion, or innovation.

However, it is important to recognize the increased complexity involved in measuring these additional dimensions. Moreover, access to reliable data on these factors may be limited, presenting practical challenges for implementation.

3.2 Team Performance Models

In this section, different types of models related to team performance are analyzed and compared on a theoretical basis.

3.2.1 Team Performance Models by Katzenbach and Smith

A well-known and widely accepted framework for team performance is provided in *The Wisdom of Teams: Creating the High Performance Organization* (Katzenbach & Smith, 2016). This thesis discusses two models for visualizing team performance introduced in that book.

The first model describes team performance by focusing on what are called the team fundamentals, which is shown in Figure 3.1.

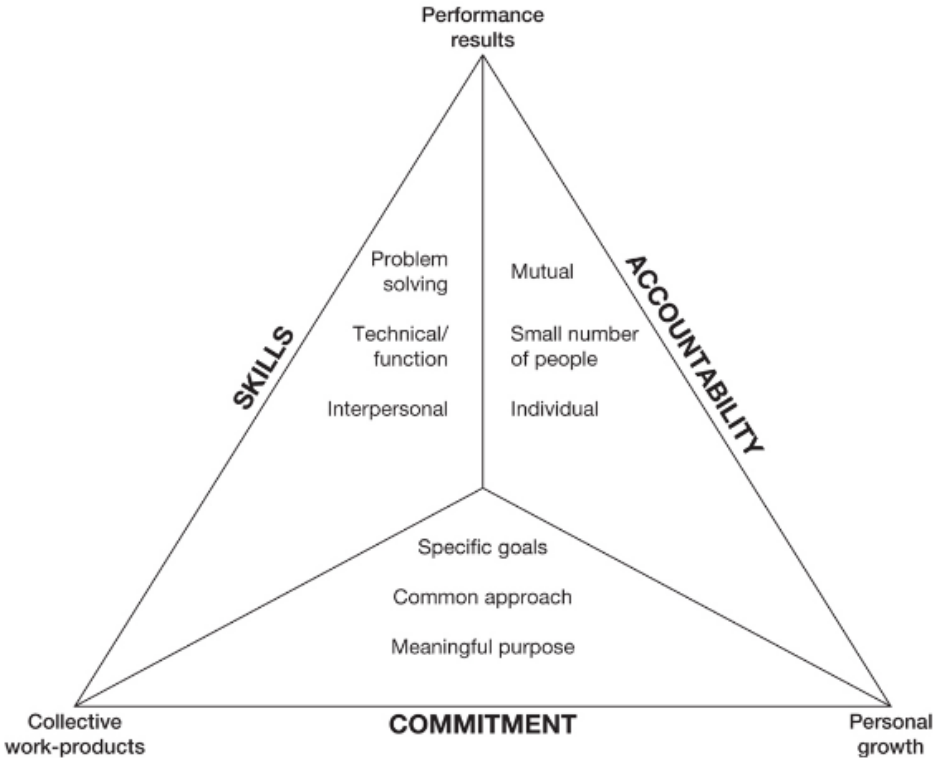

Figure 3.1: Focusing on team basics (Katzenbach & Smith, 2016).

The concept of the triangular framework emphasizes the disciplined approach needed to overcome resistance to teamwork and achieve high performance (Katzenbach & Smith, 2016). The vertices of the triangle represent the key outcomes that teams produce, while the sides and center of the triangle represent the foundational elements, or team basics, that make these outcomes possible. These fundamentals include a focus on performance and practical team principles, rather than simply striving to become a team (Katzenbach & Smith, 2016). By adhering to this disciplined framework, small groups can align their efforts and achieve results that foster true team behavior, even in the face of resistance to shared accountability and interdependence (Katzenbach & Smith, 2016).

This model provides three dimensions (capability, accountability, and commitment) that enable team performance. The smallest components (team performance factors), which provide detailed guidance for leaders, include (Katzenbach & Smith, 2016):

- **Problem solving**: The ability of team members to address challenges and work together to find effective solutions;
- **Technical/function**: The specialized knowledge and skills required to perform tasks relevant to the team's goals;
- **Interpersonal**: Skills that enable effective communication, collaboration, and relationship building within the team;
- **Mutual accountability**: A shared sense of responsibility among team members for achieving collective goals;
- **Small number of people**: Teams are most effective when they have a manageable number of members, allowing for efficient collaboration and decision-making;
- **Individual accountability**: Each team member must take personal responsibility for his or her contribution to the team's success;
- **Specific goals**: Clear, measurable goals that guide the team's efforts and align with its overall purpose;
- **Common approach**: An agreed-upon method or strategy for working together to effectively achieve goals;
- **Meaningful purpose**: A shared understanding of the team's overarching mission that motivates and unites members.

The second model describes team performance in terms of team effectiveness as shown in Figure 3.2. Elrod and Tippett (1999) outline that the horizontal line in Figure 3.2 can also be seen as team's development or maturation. In addition, they provided empirical support for the Team Performance Curve from Katzenbach and Smith (2016). The curve outlines five stages that a team may go through during its development:

- **Working group**: A group that shares information, best practices, and perspectives to support individual responsibilities without a common purpose, common goals, or the need for mutual accountability (Katzenbach & Smith, 2016);
- **Pseudo-team**: A group that lacks a focus on collective performance and has no shared purpose or goals, despite calling itself a team (Katzenbach & Smith, 2016). Their interactions inhibit individual performance rather than providing collaborative benefits. The whole is less effective than the sum of its parts (Katzenbach & Smith, 2016);
- **Potential team**: A potential team is a group with a clear need to improve performance but lacks clarity in purpose, goals, or work products and needs more discipline in developing a common working approach (Katzenbach & Smith, 2016). While collective accountability is not yet established, such teams have significant potential (Katzenbach & Smith, 2016). The greatest performance improvement often occurs when transitioning from a potential team to a real team, making any progress in this direction valuable (Katzenbach & Smith, 2016);
- **Real team**: A small group of people with complementary skills, a shared commitment to a common purpose and goals, and mutual accountability for their work (Katzenbach & Smith, 2016);
- **High-performing team**: A high-performance team is a group that meets all the criteria of a real team while fostering deep commitment to each member's personal growth and success (Katzenbach & Smith, 2016). This commitment often extends beyond the team itself, enabling the group to exceed expectations and outperform similar teams (Katzenbach & Smith, 2016).

The Team Performance Curve describes states rather than providing direct guidance. However, based on the explanation of the team stages, it can be concluded that a high-performing team requires individual accountability, mutual accountability, a common purpose, shared goals, a focus on collective performance, clarity of purpose and goals, and a strong commitment to each member's personal development and success. This also reflects several factors

of the first model mentioned.

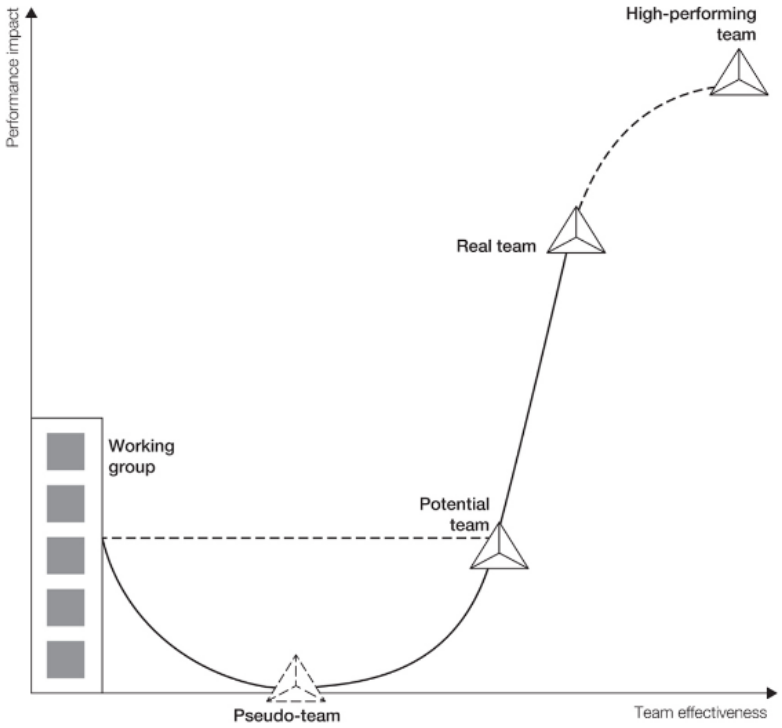

Figure 3.2: The Team Performance Curve (Katzenbach & Smith, 2016).

3.2.2 The Team Performance Model by Lencioni

In *The Five Dysfunctions of a Team*, Lencioni (2018) identifies the key obstacles that prevent teams from practicing effective teamwork. Because effective teamwork is fundamental to creating high-performing teams, Lencioni indirectly addresses team performance through the lens of teamwork. Rather than focusing on what drives effective teamwork, he highlights the factors that inhibit it, providing insight into the foundational elements necessary for team success.
The model, shown in the Figure 3.3, consists of five interdependent factors arranged in a triangular structure. Progression through the model begins at the base, as each factor must be established within the team to enable the next. This sequential approach underscores the importance of addressing foundational dysfunctions to build the trust, alignment, and collaboration necessary for high performance.

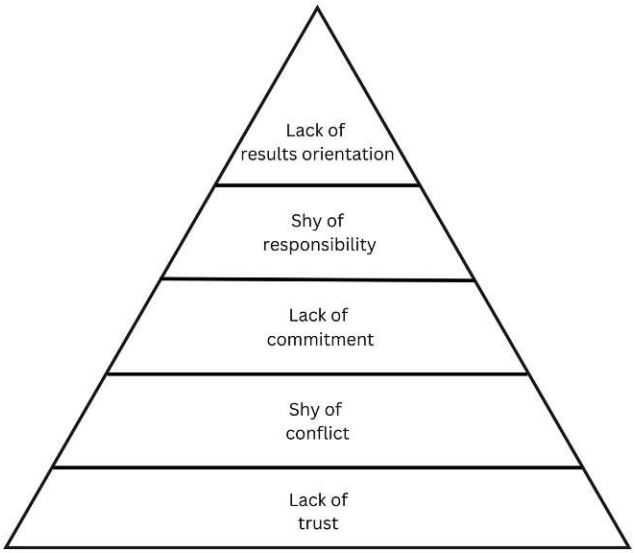

Figure 3.3: The five dysfunctions of a team. Own illustration based on Lencioni (2018).

The following are the five factors to consider:

- **Lack of trust**: It has been suggested that members of strong teams trust each other on a deep emotional level and openly share their weaknesses, mistakes, fears, and behaviors without hesitation or defensiveness (Lencioni, 2018). This openness is critical because it fosters true connection and collaboration (Lencioni, 2018);
- **Shy of conflict**: When teams trust each other, they feel comfortable having open and passionate discussions about important issues that affect the company's success (Lencioni, 2018). They're not afraid to disagree, ask tough questions, and challenge each other to find the best solutions and make the right decisions (Lencioni, 2018);
- **Lack of commitment**: Teams that openly address conflict are more likely to achieve true buy-in for their decisions (Lencioni, 2018). When everyone's different points of view are fully discussed and considered, it creates a sense of reassurance among team members that nothing has been ignored, leading to a stronger collective agreement, even if there were initial disagreements (Lencioni, 2018);
- **Shy of responsibility**: Teams that are committed to making decisions and meeting performance standards take responsibility for holding each

other accountable (Lencioni, 2018). They don't wait for the team leader to enforce rules; instead, they go directly to their peers to make sure everyone follows through (Lencioni, 2018);

- **Lack of results orientation**: Teams that trust each other, address conflicts openly, stand by their decisions and hold each other accountable are more focused on what benefits the team as a whole (Lencioni, 2018). They don't let personal goals, career ambitions, or individual status get in the way of achieving the collective success the team needs to thrive (Lencioni, 2018).

It should be noted that what is described as trust is more accurately understood as psychological safety, following the distinction made by A. C. Edmondson (2002). Although these terms are often used interchangeably, Edmondson makes a clear distinction between trust and psychological safety. To avoid misunderstandings, this distinction will be briefly explained. Psychological safety differs from trust in its time frame, object of focus, and level of analysis (A. C. Edmondson, 2002, p. 8).

For example, trust means that person A believes that his colleague, person B, will complete his part of the project on time. In contrast, psychological safety is more in line with what Lencioni's model emphasizes: if Person A makes a mistake in their part of the project, Person A feels safe sharing it with the team so that it can be resolved collaboratively.

In summary, the model highlights important factors that influence teamwork and, by extension, team performance. It should be noted, however, that the number of factors considered is relatively limited compared to more comprehensive models of team performance, such as the first model by Katzenbach and Smith mentioned at the beginning of this section.

3.2.3 The GRPI Model

The GRPI model follows a similar logic to Lencioni's model and functions as a kind of "stage/phase model" in which the latest stages are supported by the earlier ones (Muir, 2005, p. 73). Although the GRPI model by Muir (2005, p. 72) is presented primarily as a framework for managing a successful team during the course of a project, its factors and the model as a whole can also be viewed as a team performance model because of its focus on managing a successful team that can be understood as a high performing team. Furthermore, it is emphasized that it is suitable as a diagnostic tool that should be used regularly (Muir, 2005, p. 73).

The GRPI model assesses the following aspects of a project:

- **Goals**: The team's goal should meet the SMART criteria: it must be specific, measurable, attainable, relevant, and timely (Muir, 2005, p. 73). Each team member should clearly understand the goal and be able to articulate it in his or her own words (Muir, 2005, p. 73). To ensure alignment, it is important to confirm that the goals are clear and accepted by all team members, and if the GRPI model is used regularly during team meetings, this question should be revisited periodically (Muir, 2005, p. 73);
- **Roles**: Team members need to have a clear understanding of their own roles and responsibilities, as well as those of their colleagues (Muir, 2005, p. 73). Although the project scoping process is designed to identify any gaps in skills or resources, these needs may change as the project progresses (Muir, 2005, p. 73). Regular use of the GRPI model helps ensure that tasks are properly assigned and agreed upon by all team members (Muir, 2005, p. 73);
- **Processes**: This refers not to the business process the team is improving, but to the processes used to manage key team functions such as resource allocation, meetings, conflict resolution, communication, and decision making (Muir, 2005, p. 73);
- **Interpersonal**: Ideally, teams should create a safe environment where communication is open, fair, and respectful. In addition, teams should remain adaptive, allowing all members to contribute to the refinement of goals, processes, and roles (Muir, 2005, p. 73). Interpersonal dynamics are addressed last because they are often reinforced by the other foundational elements (Muir, 2005, p. 73).

When compared to Lencioni's model, there is a key difference in how they position psychological safety within the process. In Lencioni's model, psychological safety is seen as the foundation upon which other elements such as conflict resolution, accountability, and results orientation are built. It emphasizes that openness and vulnerability among team members are critical starting points for fostering collaboration and performance.
In contrast, the GRPI model views interpersonal dynamics, including elements similar to psychological safety, as the result of the alignment of goals, roles, and processes. Here, creating a safe and respectful environment is seen as the result of earlier work in clarifying team structure and operations. This distinction reflects different priorities: Lencioni focuses on "trust" (psychological safety) as the basis for teamwork, while the GRPI model sees it as a goal that emerges from well-organized team management.

3.2.4 The Team Performance Model by Drexler & Sibbet

The Drexler and Sibbet Team Performance Model emphasizes that team development is an ongoing process rather than a one-time goal. It presents a "cyclical" framework in which teams move through stages of development, constantly evolving. This model emphasizes that performance is a dynamic journey, with teams revisiting different stages as they face new challenges and opportunities for growth. It encourages continuous reflection and adaptation, reinforcing that high performance is not achieved through a fixed destination, but through continuous development and collaboration.

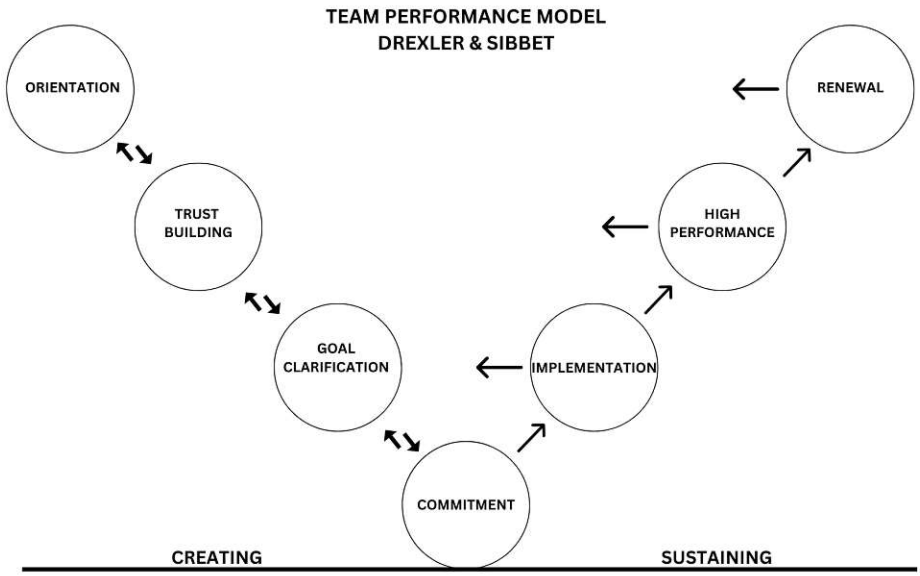

Figure 3.4: Team Performance Model by Drexler and Sibbet. Own illustration based on "A Model Depicting Team Development Stages — The Grove Consultants" (2025).

In this model, as shown in Figure 3.4, there are two sides. The left side, labeled "CREATING," focuses on the factors that enable the initial formation and development of a team. The arrows between the factors on this side are bidirectional, indicating that the relationships between these factors are dynamic, with feedback effects that influence each other. This reflects the iterative and evolving nature of team development, where changes in one area can lead to adjustments in other areas.

On the right side, labeled "SUSTAINING," is a team that has already reached a developed state. Here, the arrows between the factors are unidirectional, meaning that one factor influences the next in a sequential manner. This

means that the team has reached a more stable phase, where the dynamics are less volatile and continuity and stability take precedence. However, there are also arrows pointing from the factors on the right side back to the left side. These arrows illustrate that the sustaining phase can still influence the earlier stages of team development, ensuring that the process remains flexible and adaptable.
Each factor/stage is explained below:

1. **ORIENTATION**: This stage addresses the fundamental question of the purpose for creating the team (The Grove Consultants International, 2024). It lays the foundation for all subsequent stages by clarifying why the team exists;

2. **BUILDING TRUST**: The focus here is on getting to know the other team members (The Grove Consultants International, 2024). Each team member seeks to understand "who is who," thus fostering the trust necessary for effective collaboration;

3. **GOAL CLARIFICATION**: In this phase, the team works to establish clear and shared goals that align with the purpose defined in the orientation phase. According to Sibbet, this is the most important factor in the model (The Grove Consultants International, 2024);

4. **COMMITMENT**: Commitment occurs when the team defines how the work will be done (The Grove Consultants International, 2024). This stage ensures that all members are aligned on processes and expectations;

5. **IMPLEMENTATION**: During implementation, roles and responsibilities are clearly defined (The Grove Consultants International, 2024). The team also determines where and when tasks will be completed, ensuring clarity in execution (The Grove Consultants International, 2024);

6. **HIGH PERFORMANCE**: In this stage, the team exceeds expectations and delivers results that exceed the defined goals (The Grove Consultants International, 2024);

7. **RENEWAL**: This final stage is similar to the first and raises the question of why the team should continue (The Grove Consultants International, 2024).

Drexler and Sibbet's model is unique in that it presents performance not only as an outcome, but also as a factor influencing earlier stages. This concept is logical when considering the following example. Imagine that Person A and Person B both put the same amount of effort into their projects. If Person B consistently achieves his goals while Person A repeatedly fails, this discrepancy would likely demotivate Person A over time. In addition, this model clearly shows that there are interdependencies among the factors that affect team performance.

3.2.5 Group Development Model by Tuckman

Probably the most popular model known when it comes to group development is that of Tuckman. He describes the team development process as a stage process, similar to the one presented earlier in this thesis by Katzenbach and Smith. The model originally consists of four phases, which are explained below:

1. **Forming**: The initial phase of group formation is characterized by the members' exploration of the boundaries that define their collective limits. It is essential to explore the range of acceptable behaviors. During this phase, they also form dependencies on leaders, other members, or existing norms (Tuckman, 1965, p. 396);

2. **Storming**: The second stage, storming, involves conflict and emotional reactions as group members resist influence and task demands, often polarized over interpersonal issues (Tuckman, 1965, pp. 396–397);

3. **Norming**: The norming stage occurs when the group overcomes resistance, builds cohesion, establishes new norms and roles, and begins to openly share personal perspectives (Tuckman, 1965, p. 397);

4. **Performing**: In the performing stage, the group develops a flexible and effective structure to support its work. Roles adapt as needed, and the group's energy is fully directed toward achieving its goals, with structural concerns no longer an issue (Tuckman, 1965, p. 397);

Later, Tuckman added another stage to his model, making a total of five stages (Tuckman & Jensen, 1977, p. 419). The additional stage is called:

5. **Adjourning**: It's particularly relevant at the organizational level, such as during restructuring (Jones, 2019, pp. 26–27). This stage emphasizes celebrating the team's success to recognize their hard work and perseverance (Jones, 2019, pp. 26–27). Acknowledging their accomplishments boosts morale and confidence, motivating the team to approach future challenges with greater enthusiasm and determination (Jones, 2019, pp. 26–27).

Tuckman's model doesn't directly outline specific performance factors for each phase, but it does provide valuable insight into the dynamics that can occur during team development. This understanding allows leaders to reflect on the team's progress and think about the actions they need to take at each stage. By recognizing the typical challenges and behaviors at each stage, leaders can better guide the team and take appropriate steps to support its growth and success.

3.2.6 More Modern Team Performance Models

Although the earlier models are still relevant, there are newer models that focus more on the interdependencies between individual factors that affect team performance. One such model is shown in Figure 3.5. Ficapal-Cusi et al. (2021) presents a comprehensive model of team performance that integrates factors at the individual, group, and organizational levels. It outlines a set of practices and behaviors that collectively enhance overall organizational performance (Ficapal-Cusi et al., 2021, p. 5).

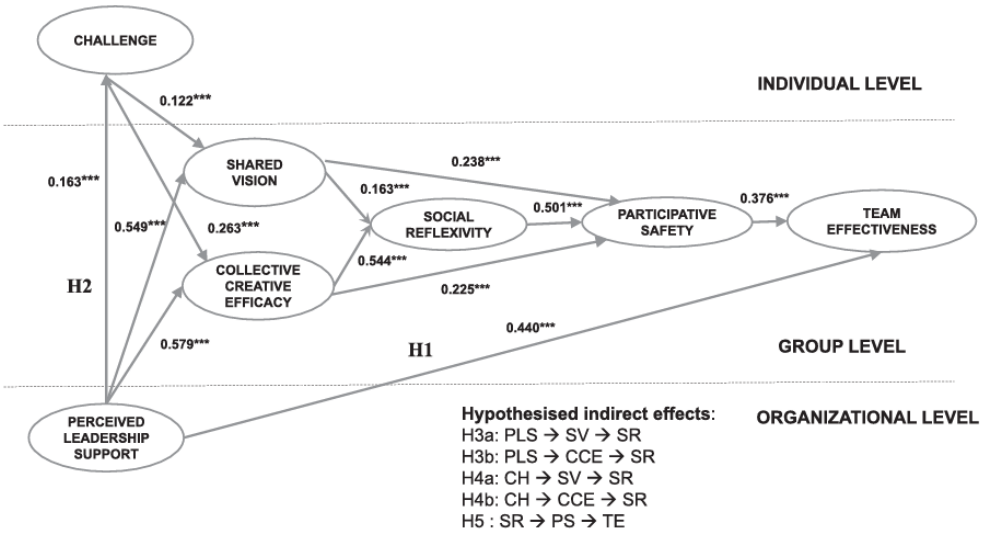

Fig. 1. Results of the structural model of team performance.
Note: *p < 0.1; **p < 0.05; ***p < 0.001.

Figure 3.5: Structural model of team performance (Ficapal-Cusi et al., 2021, p. 7).

For example, according to Figure 3.5, a shared vision not only affects the level of social reflexivity, but also participative safety, which appears to be the same as psychological safety.

Another factor not mentioned in the previous models that seems to have an important influence on many other factors and directly affects team performance is perceived leadership support, also shown in Figure 3.5.

In reality, many factors can influence each other and the interdependencies are quite complex, so a model that realistically represents the system of team performance may consist of many feedback loops. A model that attempts to capture these interdependencies and the complexity of the team performance system is shown in Figure 3.6.

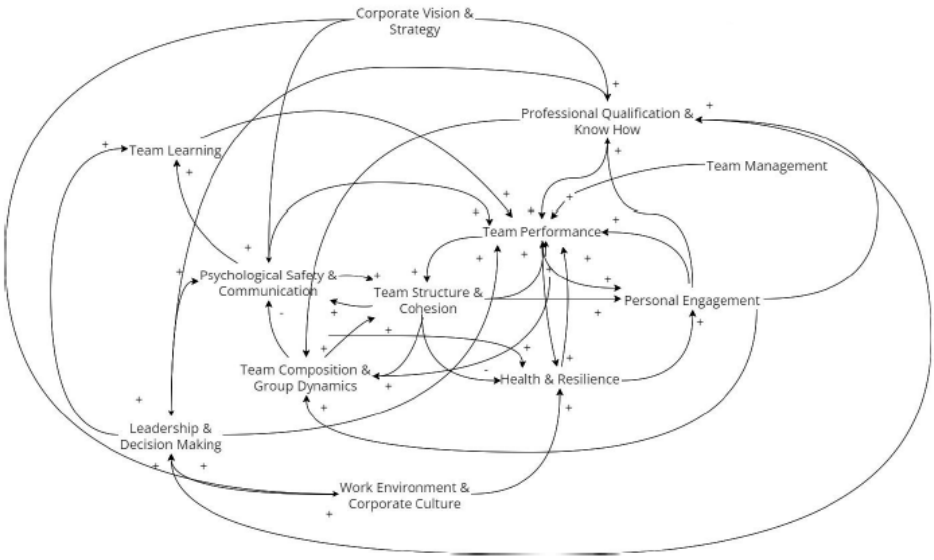

Figure 3.6: A more realistic systemic model of team performance (Schönangerer, 2024, p. 55).

This model includes many of the important factors mentioned in previous models, and also shows how the factors influence each other. There are mostly positive influences, marked with a plus symbol, but also negative influences, marked with a minus symbol, for example “Health & Resilience” as shown in Figure 3.6.

Considering all the models presented and referring back to Chapter 2, the question arises: which model is the most appropriate choice? Well, this is a difficult question to answer and it always depends on who is asking the question. As mentioned in Chapter 2, a model should describe the system to a reasonable extent, and the model should be useful for the purpose the user wants. Therefore, simplifying the model to enhance cognitive usability is of-

ten advisable, aiming for a representation that neither overfits nor underfits the system it describes. This process involves finding an appropriate balance between variance and bias.

In general, several models offer a comprehensive overview of team performance systems, including Tuckman's model, Katzenbach and Smith's Team Performance Curve, and the model by Drexler and Sibbet. These models explain team performance through an effective team development process. Along the way, they highlight factors that provide clear guidance on what actions are important at each stage of the process. Ultimately, a high performing team emerges as a result of this developmental journey.

There are also models, such as Lencioni's and the GRPI model, that include stages in their process but do not emphasize them in the same way as the others. These models do not specify when a team is formed or what type of team it is, as Katzenbach & Smith or Tuckman do. Instead, they outline stages that should be met to enable a high performing team, but rather than giving these stages descriptive titles like "forming" or "storming," the focus is on the factors that need to be addressed within each stage. Therefore, these models focus more on the factors that need to be addressed to achieve high team performance, rather than providing a detailed breakdown of stages or phases and explaining what happens during each phase.

However, all of these models claim that certain actions or factors should be considered at a certain stage or in a certain order. This may not always be realistic, especially in an organizational setting where a leader, may need to address multiple actions simultaneously rather than following a strict sequential order. For example, in a project team working on a product launch, traditional models might suggest that the team first build trust (forming), then define roles (norming), and so on. In practice, however, a leader may need to address trust building, role clarification, and progress toward the launch all at once. This might include defining roles while encouraging open communication to build trust, and setting short-term goals to ensure the project stays on track. Addressing multiple factors simultaneously may not be consistent with a phased approach, but is often essential in fast-paced environments. In this thesis, such models that provide some sort of stage/phase process will be referred to as **framework-focused models**.

The more modern models, such as those shown in Figures 3.5 and 3.6 in this thesis, focus more on the individual factors that influence team performance and the interdependencies between them. However, they do not attempt to categorize these factors within a particular phase framework or assign a par-

ticular order to them. It can also be seen in Figure 3.6 that the more modern models also mention other factors influencing performance, such as leadership, which also have a major impact. The more modern models presented, especially the one shown in Figure 3.6, include many factors and show the interdependencies between them, which could provide a more realistic representation of team performance as a system. In addition, this approach could reduce variance and bias. However, the model may become too cognitively complex, which could limit its practical usability for leaders. The excessive detail and interconnectedness may make it difficult for leaders to effectively apply the model in real-world scenarios. In this thesis, these types of models are referred to as **factor-focused models**.

One model that seems to strike a balance between the factor-focused and framework-focused approaches is the so-called Value Chain Model, which will be examined in the following section based on the discussion above.

3.2.7 The Value Chain Model

The Value Chain Model adresses nearly the same factors as the models in the Sections 3.2.1 - 3.2.5, which makes sense because these factors are directly within the leader's control. In addition, this model emphasizes that the satisfaction of these factors that influence team performance is always linked to the mindset, skills, and behaviors of the leader. Therefore, it also takes the leadership aspect into account, similar to the more recent models presented in Figures 3.5 and 3.6 in this thesis. It also introduces factors that take into account the competitive environment and how team members respond to it. Therefore, it offers a greater number of factors in comparison to the framework-based models that have been discussed. In addition, it provides a structure that remains clear and does not involve complicated interdependencies between factors. This gives it a cognitive advantage over the factor-based models.

In the model shown in Figure 3.7, the factors to develop are oriented around the circle as a set of three per value chain. For each value chain, there are now three tasks to be performed in order to achieve the goals for the desired value chain, which represents the "leadership behavior". These value chains, also called performance dimensions, and the actions of a leader in the form of leadership behavior, are explained below.

Execution: Efficiency in high-performing teams comes from having clear, shared goals, well-defined roles, and structured processes (Güttel et al., 2024, p. 130). Execution describes the actions that focus on these aspects. The three tasks of "prioritizing," "assigning," and "tracking" are important. Prioritiz-

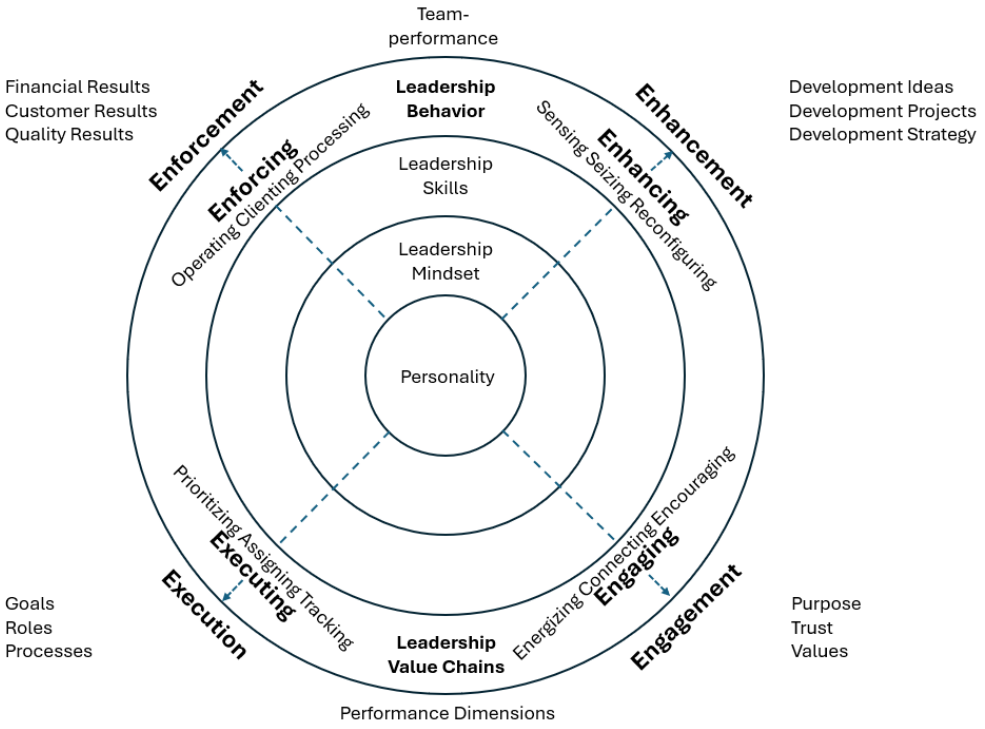

Figure 3.7: Value Chain Model (Güttel et al., 2024).

ing involves ensuring that all team members clearly understand their goals, tasks, and processes (Güttel et al., 2024, p. 139). Assigning refers to the process of distributing tasks and responsibilities within a team. It emphasizes the importance of a consistent role structure and clear processes to enable each team member to perform his or her tasks effectively (Güttel et al., 2024, p. 139). Tracking refers to the process of monitoring progress toward goals and discussing it openly in meetings (Güttel et al., 2024, p. 139). This helps determine whether team members are on track or if adjustments are needed to optimize performance.

Engagement: To reach their full potential, teams need clear purpose, mutual trust, and meaningful opportunities to actively contribute (Güttel et al., 2024, p. 139). Again, three tasks are relevant. ”Energizing” means creating an environment that inspires and motivates the team, taking into account the unique characteristics and preferences of each member (Güttel et al., 2024, pp. 139–140). ”Connecting” means a leader actively works to build trusting relationships so that team members feel connected to each other and to the leader (Güttel et al., 2024, p. 140). Finally, ”Encouraging” refers to creating opportunities for active involvement and participation, ensuring that each

team member has an equal voice in the decision-making process (Güttel et al., 2024, p. 140).

Enhancement: Enhancement is the dimension that covers the aspects of developing and evolving as a team. Again, (Güttel et al., 2024) provides three tasks to focus on to achieve new creative ideas, projects or strategies to gain competitive advantage. "Sensing" refers to the process of actively perceiving, identifying and understanding opportunities or challenges within a given context (Güttel et al., 2024, p. 140). Often situations are complex, and to fully understand them, "Sizing" can be helpful. It means taking action by carefully considering and deciding what to do with an idea or opportunity (Güttel et al., 2024, p. 140). It's about evaluating the situation, weighing the pros and cons, and then deciding whether or not to move forward. It's important to involve the team in this process, as their input will help ensure better, more informed decisions (Güttel et al., 2024, p. 140). The final task in realizing the full potential of this value chain is "Reconfiguring", where it is important to adjust or realign resources, strategies, or structures within an organization to ensure that innovation or change initiatives are effectively implemented (Güttel et al., 2024, p. 140).

Enforcement: The final value chain describes the fact that the leader is responsible for the long-term success of the organization, which depends on maintaining financial stability, consistent demand, and high quality (Güttel et al., 2024, p. 140). To do this, it is important to do "Operating". In this context, it refers to the process of actively managing and monitoring the financial performance of a team (Güttel et al., 2024, p. 140). This is important to ensure that resources are used efficiently. Another important aspect is "Clienting", which refers to the practice of aligning a team to be highly attuned to customer needs and ensuring that the team can respond to those needs in a timely manner (Güttel et al., 2024, p. 140). Last but not least, there is "Processing" to be done. "Processing" is the ongoing activity that ensures that the work being done meets the required quality standards (Güttel et al., 2024, p. 140).

To actively manage these activities along the value chains, it is necessary to have certain skills. These are represented by the "Leadership Skills", which stand for technical skills, methodical skills, social skills and strategic-conceptual skills (Güttel et al., 2024, pp. 142–143). It is important for an effective leader to be able to shift focus and time across these four skills in order to effectively address the specific demands of the team's performance dimensions. The next inner circle represents the "Leadership Mindset" that influences how leaders use their skills. This leadership identity reflects a unique blend of mindsets

that influences where they focus their attention and which leadership activities and tasks they prioritize (Güttel et al., 2024, p. 144). At the core of the performance model is the "Personality" circle, which signifies that the other circles are strongly influenced by the leader's personality. It emphasizes the importance of constant self-reflection on all of the above in order to develop the team by recognizing and overcoming one's own deficits (Güttel et al., 2024, p. 147).

In summary, the Value Chain Model provides a balance between complexity and cognitive understanding. It includes the factors from the framework-based models presented in this thesis, but also provides a more holistic view by highlighting factors that belong to the leader of a team. It also sacrifices the "stage" or "phase" logic, allowing for more flexible application. However, for better cognitive understanding, it provides four performance dimensions, as shown in Figure 3.7, that align the performance factors. It also mitigates the interdependencies of each factor compared to the newer factor-based models in Section 3.2.5 to gain cognitive advantages.

Following the principle that a model should be as simple as possible yet as complex as necessary for its intended purpose, attention turns to the two fundamental requirements that a model must fulfill. First, it should serve the user's purpose. The purpose mentioned in the introductory chapter (see Chapter 1) was to find a model that would support the hectic day-to-day work of a manager by providing guidance on how to achieve a high-performing team. The Value Chain Model fulfills this purpose in terms of the cognitive guidance it provides by including the factors of the framework-focused models and also others such as the leadership components of the newer model. In addition, it offers flexibility by not imposing a step-by-step process.

The second requirement is the fit between the target system and the model. This requires empirical testing. To do this, the key aspect of the model, that performance is achieved by maximizing the four performance dimensions, is tested, leading to the first hypothesis.

H1: The better the 4 performance dimensions are developed in the team, the more successful the team will be (in the long run).

Regarding the purpose, the model should be useful in the hectic day-to-day work, and therefore time is something that is often a rare commodity for a leader. It is interesting to see if there is a particular performance dimension that has a greater impact on team performance than others. If time is a scarce commodity, one could focus on that dimension. Of the four dimensions, "En-

hancement" makes the most sense because the goal is to permanently improve the team. This leads to the second hypothesis.

H2: The better the Enhancement dimension is developed, the better the rate of increase in team performance (because the team is constantly improving).

When considering H1 and H2, it is important to note that how the dimensions are developed also matters. What does this mean? A dimension is considered developed when team members share a collective and consistent understanding or feeling about a factor. To illustrate, if three team members provide feedback on their satisfaction with the goal clarity factor on a scale of 0 to 10, the goal should not only be to achieve a high average score, but also to ensure consistency in the scores. For example, if a team scores 7 overall because two members gave very high ratings and one member gave a much lower rating, that team would likely perform worse than a team where all members uniformly rated 7. This is because inconsistencies create friction within the team, resulting in lower performance.

This idea can be compared to a water pipe: even if most of the inner surface is smooth, rough patches can create turbulence that disrupts the overall flow and significantly affects performance. Such considerations should be taken into account when measuring dimensional development. A third hypothesis is proposed to support this claim.

H3: The more uniform the team (in a positive sense), the better the team performance.

These three hypotheses together test different facets of the Value Chain Model's system fit. H1 validates the model's core structural claim that team performance depends on the four performance dimensions. Hypothesis H2 examines whether the *Enhancement* dimension might have a greater impact on the performance growth rate. H3 explores internal alignment at a deeper level by testing whether uniformity (in a positive sense) among team members improves team outcomes.

Chapter 4

Methodology

In this chapter, the practical hypothesis testing methodology is described in detail. The study follows a quantitative approach to examine the factors that influence team performance. Questionnaire is used to assess team dynamics and identify key performance factors based on the Value Chain Model. These factors represent the independent state variables of the model. The performance data collected are specific to each company and the tasks performed by the teams and represent the dependent variables. To ensure a comprehensive analysis, both input and output variables are included in the calculations when necessary to build robust performance scores.

To minimize bias, teams from three different companies operating in different industries were analyzed:

- Company A - IT Services and Infrastructure Sector.
- Company B - National Defense Sector.
- Company C - Plastics Processing Sector.

This approach ensures a diverse data set and allows for a more robust comparison of team performance in different work environments. Within each company, at least two teams performing similar work tasks were compared to explore the hypotheses.

4.1 Company Profiles and Performance Evaluation

4.1.1 Company A - IT Services and Infrastructure Sector

The company operates in the IT services and infrastructure sector, specializing in technical services for point-of-sale (POS) systems, e-mobility and network solutions. Two different departments were analyzed.

Department ”AA” consists of technicians who mainly perform technical work at the point of sale related to the above mentioned business topics. Therefore,

they must also perform logistical planning to determine the order in which they travel to the customer. Two regional teams of five people each are compared. Team "AA_Team1" works mainly in a larger city, while team "AA_Team2" works in rural areas. The performance indicator, or more precisely the result that the company monitors, is the total number of orders fulfilled per week in relation to the target number of orders set by the company. To take into account the different logistic routes between urban and rural areas in terms of the length of the routes between customers, the target number of orders set for rural areas is therefore lower. In addition, the working hours of employees are different. This results in a target order number that takes into account the different working areas and working hours. This target order number is specific to each worker. These target order numbers were provided by the company. The company also provided the number of orders achieved per day per worker for this thesis. To create a performance score, the achieved orders per week from the year 2024 were summed weekly for each team and the target order numbers were also summed weekly to create the basis for the following formula:

$$\text{Performance Score AA (\%)} = \frac{\text{Achieved Orders per Week}}{\text{Target Orders per Week}} \cdot 100$$

The second department to be analyzed is the company's headquarters , where two teams of four people are compared. The teams "AB_Team1" and "AB_Team2" both mainly do paperwork. They try to solve technical problems directly with the customer or support a technician. So they get "tickets" that represent a customer request and they have to solve it. Here, the performance metric the company is looking for is how many responses a team member has to provide to close a ticket, given the different work hours that indicate input. The company does not have a target number of tickets. The company provided a dataset covering two-thirds of 2024. The number of solved tickets per employee per day was given, as well as the number of responses to a ticket. This data was summed to get the solved tickets per week and also the responses to those tickets per week. The performance score can now be calculated as follows:

$$\text{Performance Score AB} = \frac{\text{Tickets per Week} \cdot 100}{\text{Answers to those Tickets per Week} \cdot \text{Working Hours}}$$

The higher the score, the better the performance. Here the performance is multiplied by 100 to get nicer numbers in the graph later.

4.1.2 Company B - National Defense Sector

The company working in the national defense sector mainly performs engineering work for military equipment. Here two different teams are compared.

Team "B_Team1" and "B_Team2" each have five employees. The output data to be considered is the number of projects and how many projects are successfully completed during one year. After communicating with the company, it was noted that the workload on both teams is the same and the working hours are also identical. Therefore, the input of each team is already respected within the target workload, represented in the target volume of workload for one year. As a result, the performance score, can be calculated again:

$$\text{Performance Score B (\%)} = \frac{\text{Achieved Workload}}{\text{Target Volume Workload}} \cdot 100$$

It should be noted that it is not the pure number of projects divided by the number of open projects that is relevant, but rather the degree to which a project is fulfilled. Therefore, all the percentages are summed up, taking into account the two factors mentioned in the formula above, and with respect that the projects have a similar workload. The data provided by the company covers the years 2023 and 2024, in the form of an annual report showing the degree to which certain projects are fulfilled.

4.1.3 Company C - Plastics Processing Sector

The company operates in the plastics processing sector, focusing mainly on coatings. Two sales teams, "C_Team1" and "C_Team2", were analyzed, one with four and one with five team members. The key performance indicator for the sales department is how close the sales teams are to the target budget. This is reviewed on a monthly basis. The data provided by the company refers to the first quarter of 2025 on a monthly basis. Performance is therefore calculated as follows:

$$\text{Performance Score C (\%)} = \frac{\text{Actual Budget per Month}}{\text{Target Budget per Month}} \cdot 100$$

It is important to meet or exceed the target. Undershooting is undesirable. Again, different team sizes are considered due to team-specific budget targets.

4.2 Questionnaire Design

4.3 Methodology and Data Collection

In this thesis, the dynamics of different teams representing the performance factors were assessed using an existing questionnaire provided by the Institute. The questionnaire was distributed to team members via a Google Forms link, making it an online survey. The questionnaire consists of 108 questions, each tailored to the Value Chain Model. This questions can be seen in appendix A. For improved readability, the performance dimensions and performance factors will be written in italics from this point onward.
The questions are organized into four performance dimensions: *Execution*, *Enhancement*, *Engagement*, and *Enforcement*, as shown in Figure 3.7. Each dimension contains 27 questions designed to explore the associated performance factors. Specifically, the questions within each dimension explore the following factors:

- ***Execution***: Focuses on *Goals*, *Roles*, and *Processes*.
- ***Enforcement***: Focuses on *Financial Results*, *Customer Results*, and *Quality Results*.
- ***Enhancement***: Focuses on *Development Ideas*, *Development Projects*, and *Development Strategy*.
- ***Engagement***: Focuses on *Purpose*, *Trust*, and *Values*.

Each performance factor is represented by nine questions, ensuring a comprehensive analysis of each factor. To ensure completeness, each question was mandatory, meaning no answers were left incomplete. Team members were given 14 days to complete the questionnaire.
The questions were designed with closed-ended response options using a Likert scale. Research suggests that a scale with four to seven response options yields similar results with consistent psychometric quality (Biemann & Weckmüller, 2023, p. 46). For this reason, a 5-point Likert scale was chosen, ranging from 1 (*Not very applicable*) to 5 (*Very applicable*). The intermediate options (2, 3, 4) were left without specific descriptions.
To ensure correct interpretation of the scale, it was also emphasized that the middle point (3) should not be interpreted as neutral. Rather, the scale was designed to measure satisfaction, with the intention that the range would be from low to high, with no intermediate ”neutral” interpretation.

4.4 Analyzing the Data

When it comes to analyzing the data, the method of choice for this thesis would be to perform a multiple linear regression for hypothesis testing. This is because the data contains one dependent variable (team performance) and four independent variables in the form of the performance dimensions defined by the Value Chain Model.
When using multiple linear regression as a testing method, power is one of the most important factors in verifying or falsifying the hypotheses. The power of a statistical test can be understood as the probability that a test will correctly detect a true effect (Ellis, 2010, p. 52). Power is highly dependent on sample size. If the sample size is too small, the risk increases that the test will miss important effects (Ellis, 2010, p. 52). This problem is called underfitting and increases bias, as discussed in Section 2.1.2. However, with small sample sizes, overfitting can also be a problem, because with multiple linear regression, the regressors may be fitted to a small amount of data, increasing the risk of unstable regression coefficients and thus higher variance with other data.
The question then arises: what level of power should be aimed for? According to (Doncaster & Davey, 2007, p. 249), a good level of statistical power is 80%, meaning that a test has an 80% probability of detecting a true effect. The remaining question is whether the available data have a sufficient sample size for this target power. According to (Maxwell, 2000, p. 454), for four predictors and a power of 80%, approximately 311 samples are needed. This calculation assumes medium zero-order correlations, which were not tested in this thesis. Nevertheless, it indicates that the sample sizes provided by the companies, where the largest team has only 53 samples, are far too small.
For this reason, no statistical hypothesis testing is performed in this thesis. Instead, a descriptive analysis of the data will be conducted, giving the results an exploratory nature.

To analyze performance dimensions and factors, the scored points will be summed up and displayed as a percentage of the maximum points achievable by each team. This is mainly relevant for exploring H1. For hypothesis H2, the rate of increase in team performance is important. When possible, trend lines will be fitted, and those rates will be used for comparison. When addressing hypothesis H3, one might initially consider comparing the teams' variability by examining the average standard deviations for each factor and dimension. However, this approach only makes sense if all dimensions are equally developed. A key problem arises when higher variability coincides with better performance. This would contradict the core idea of H3, which emphasizes "uniformity in a positive sense". A low standard deviation alone may indicate agreement within a team, but that agreement could be around

low scores, reflecting a shared perception of underdevelopment. In such cases, the quality of agreement is questionable. Therefore, to properly assess H3, both the mean value and the standard deviation must be taken into account. To capture this relationship, a key figure for H3 is calculated as follows:

$$KF_{H3} = m - s \cdot k$$

where m represents the mean score, s the standard deviation, and $k \in [0.1, 1]$ is a weighting factor that controls the influence of the deviation on the overall key figure. If $k = 1$, the metric reflects a mean worst-case scenario, where the full effect of disagreement is considered. The weighting factor k will be tested in incremental steps from 0.1 to 1 in order to examine whether a shift occurs in which one team is highlighted as better. If no such shift (i.e., pivot point) is observed within this range, meaning that the same team consistently shows higher KF_{H3} values, the final key figure for comparison will be based on $k = 1$.

Chapter 5

Data Analysis – Exploring the Hypotheses

This chapter analyzes the data collected through questionnaires representing team dynamics and performance data provided by companies.

5.1 Company A - IT Services and Infrastructure Sector

5.1.1 Department AA

The first thing to look at is how each team scored on the performance dimensions. This is shown in Figure 5.1. The x-axis shows the different performance dimensions, and the y-axis shows the percentage of points scored on each dimension.

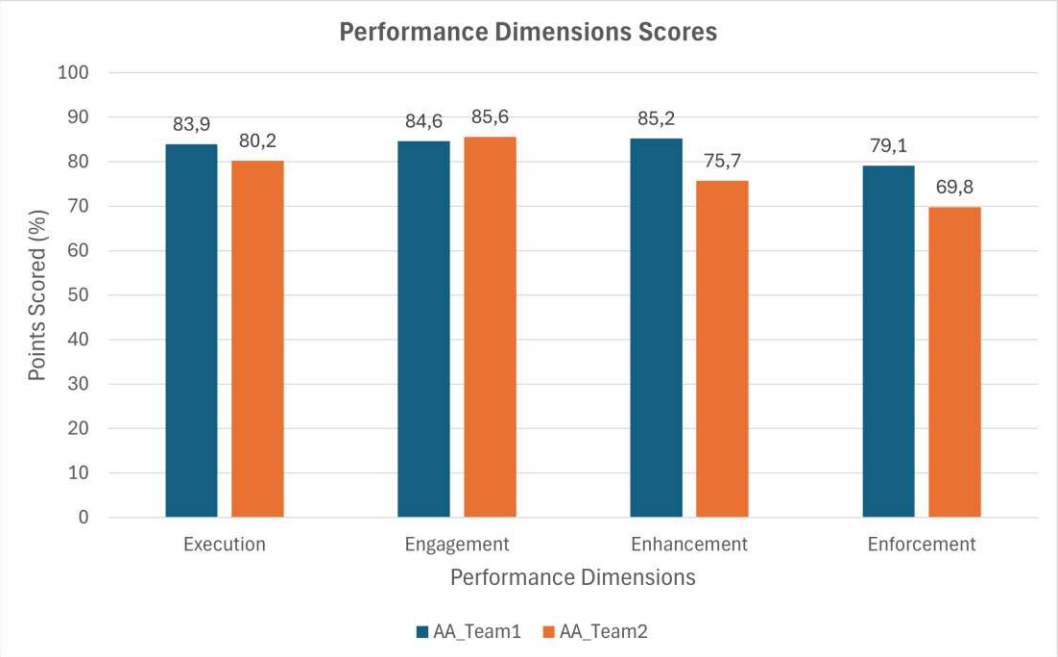

Figure 5.1: Performance dimension scores for Company A, Department AA.

It is clear that Team 1 has the advantage in three out of four dimensions. In the *Execution* dimension, Team 1 leads nearly by about 4% In the *Engagement* dimension Team 2 takes the lead but at such a small scale that this dimensions seems developed equally. In the *Enhancement* dimension, Team 1 has a higher score by about 9.5%, and in the *Enforcement* dimension, at about 9.3%.
Looking at the highest scoring dimension of Team 1, *Enhancement*, it has a potential of about 14.8%, and in the *Enforcement* dimension it has 20.9%, which is the lowest dimension. In Team 2, the highest scoring dimension is *Engagement* with a gain potential of 14.4%. The lowest dimension in Team 2 is *Enforcement* with a gain potential of 30.2%.
To determine if one team's dimension is truly superior to another's, one must examine the performance factors and analyze which factor is causing the dimensional score to increase or decrease, or if the dimensional score is the result of an even distribution of high and low performance factors.

The performance factors are shown in Figures 5.2 and 5.3. The y-axis represents the percentage of points scored for each factor, while the x-axis lists the individual performance factors. Focusing on the first three factors *Goals*, *Roles*, and *Processes* ,within the *Execution* dimension, Team 1 shows stronger development in two out of the three. Although Team 2 scores slightly higher in the factor *Processes*, the difference is minimal and can be considered negligible. Overall, based on these three factors, the *Execution* dimension is more developed in Team 1.
Moving on to the next factors *Purpose*, *Trust*, and *Values*, within the *Engagement* dimension, Team 2 shows stronger development in two out of the three compared to Team 1. However, the factor *Purpose* is considered equally developed, as Team 2's lead is minimal. For the remaining factors, the advantage alternates between the teams with similar, relatively small margins. As a result, the *Engagement* dimension can be considered equally developed in both teams.
Analyzing the factors *Development Ideas*, *Development Projects* and *Development Strategy*, it becomes clear that Team 1 has better developed factors. Here the minimum advantage for Team 1 is 5%. Therefore, the *Enhancement* dimension is clearly better for Team 1.
For the last three factors, *Financial Results*, *Customer Results*, and *Quality Results*, Team 1 is better than Team 2 again, although the last factor has such a small lead that it could be considered equal. The lead for the other two factors here is at least 13.3%, which gives the dimension belonging to these factors an overall better performance for Team 1.

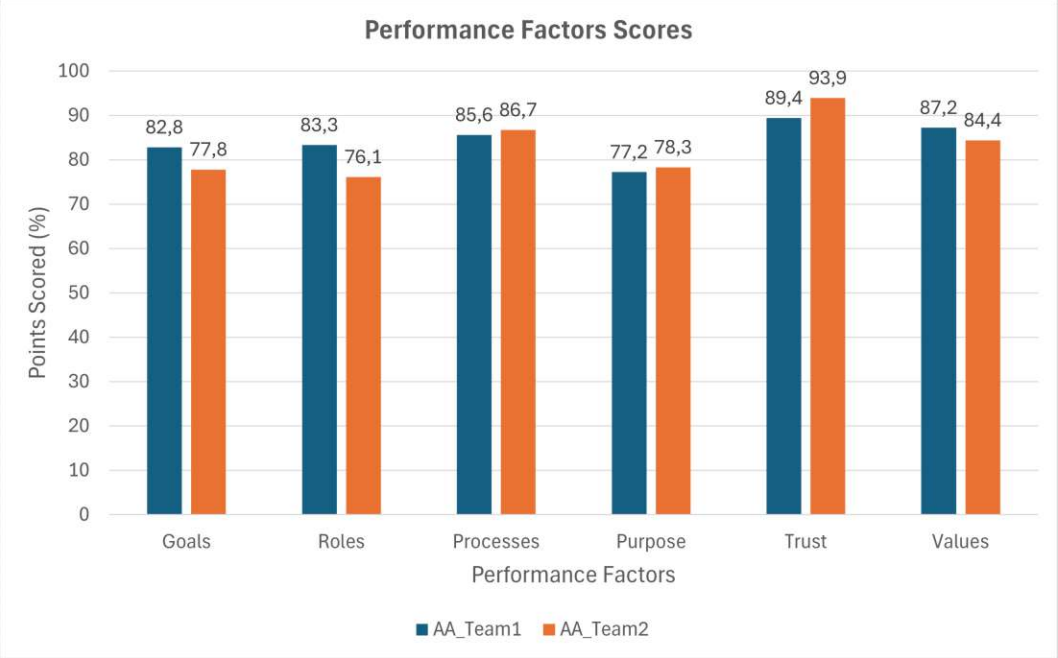

Figure 5.2: Performance factor scores for Company A in the *Execution* and *Engagement* dimensions in Department AA.

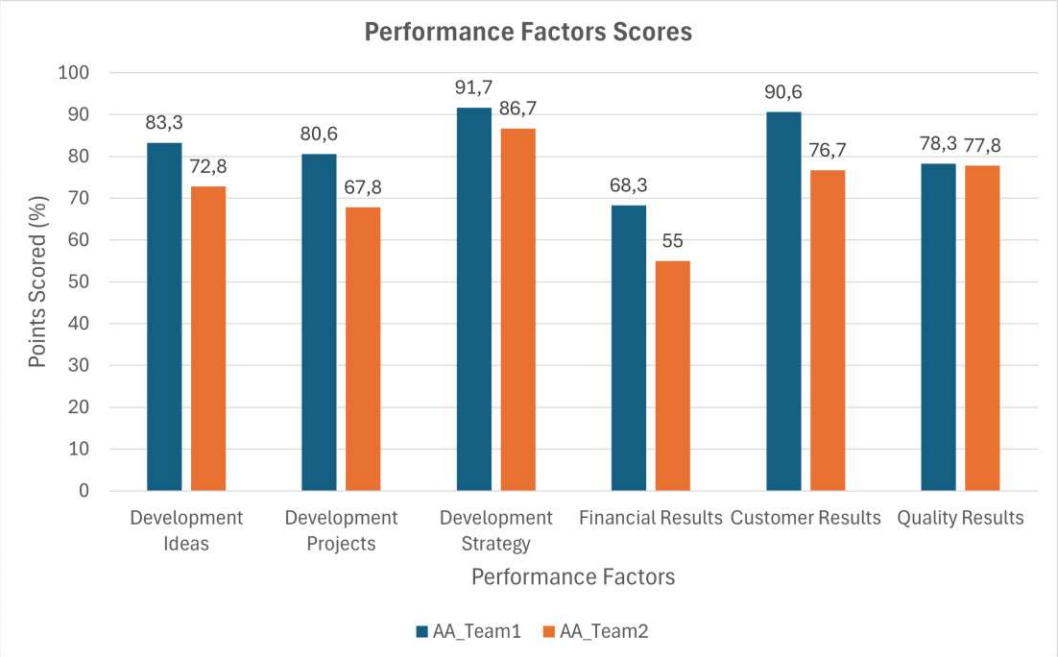

Figure 5.3: Performance factor scores for Company A in the *Enhancement* and *Enforcement* dimensions in Department AA.

The next step is to analyze the performance in order to draw conclusions regarding the hypotheses. The performance of the teams is illustrated in Figure 5.4. As mentioned in Section 4.1.1, a target performance has been defined for Department AA. Accordingly, the y-axis displays the achieved performance in percentage, while the x-axis represents the calendar weeks of the year 2024. Analyzing the performance graphs in Figure 5.4, it is clear that Team 1 performs significantly better than Team 2 throughout the fiscal year. It is interesting to note that in both teams the performance fluctuates quite a bit and is low at the beginning and at the end of the year.

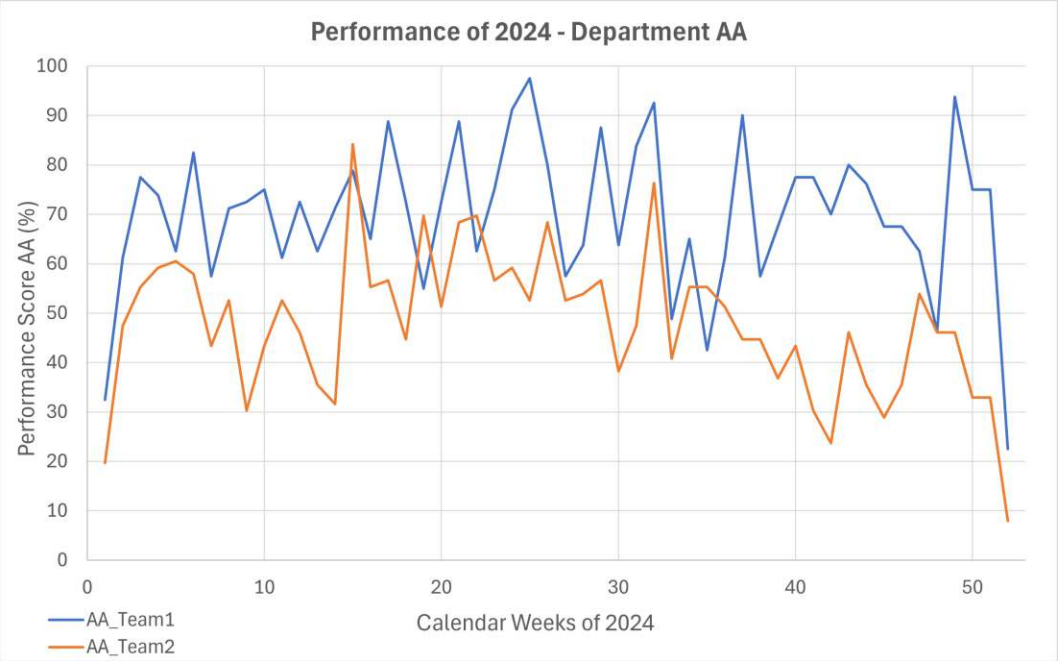

Figure 5.4: Weekly performance of both teams in Department AA in 2024.

Looking at hypothesis **H1**, one must link the development of the dimensions and the performance. As already analyzed, three of the four performance dimensions in Team 1 are clearly better developed, while the fourth can be seen as equally developed. Furthermore, the performance throughout the year was much better. This fact supports H1.
In relation to **H2**, it is necessary to examine the annual growth rates presented in Table 5.1 and the performance within the *Enhancement* dimension. The annual growth rates were derived from the slopes of linear trend lines fitted to the performance data shown in Figure 5.4. To improve the accuracy of the trend lines, the data were divided into two halves of the year. As shown, Team 1 exhibits higher growth rates in both periods. This, combined with stronger performance in the *Enhancement* dimension, provides overall support for H2.

Table 5.1: Annual performance growth rates for Department AA based on linear trendlines fitted in Excel.

Calendar Weeks	Team 1	Team 2
1-25	0.911	0.736
26-52	-0.315	-1.124

To investigate the last hypothesis **H3**, the mean key figures KF_{H3} with respect to the dimensions and factors must be analyzed. This is visualized in the form of a heat map in Figure 5.5. Here, the smaller (i.e., worse) the key figure, the darker the color of a field. The claim of H3 is that the more uniform a team is (in a positive sense), the better the performance should be.
Looking at the dimensions, Team 1 has higher key figures in three out of four cases. At the level of performance factors, this pattern remains consistent. Team 1 has higher key figures in eight out of twelve factors. These findings provide initial support for hypothesis H3, which states that greater internal agreement, combined with high mean scores, is associated with better overall team performance.

Dimensions/Factors	AA_Team1	AA_Team2
Execution	3,237	3,157
Engagement	3,442	3,697
Enhancement	3,220	3,028
Enforcement	3,101	2,779
Goals	3,348	2,945
Roles	3,010	2,840
Processes	3,351	3,686
Purpose	2,878	3,285
Trust	3,831	4,282
Values	3,617	3,525
Development Ideas	3,048	2,828
Development Projects	2,707	2,633
Development Strategy	3,904	3,622
Financial Results	1,879	1,988
Customer Results	3,886	2,858
Quality Results	3,592	3,582

Figure 5.5: Heatmap of the mean values of the key figures $KF_{H3}(k = 1)$ across dimensions and factors for Company A, Department AA.

5.1.2 Department AB

The different scores for the performance dimensions of Department AB are shown in Figure 5.6. Here, the x-axis shows the performance dimensions and the y-axis shows the team's scores as a percentage of the maximum available points. Team 1 leads in all four dimensions. In the *Execution* dimension, Team 1 has 4.6% more than Team 2, and in the *Engagement* dimension, Team 1 has a 6.9% lead. Looking at the *Enhancement* dimension, Team 1 still has the lead at around 5.2% as well as in the *Enforcement* dimension.
Looking at the highest scoring dimension, there is only 11.6% potential left for Team 1 and 17.2% for Team 2. In the lowest dimension, the potential is about 32.8% for Team 1 and 38% for Team 2. To better understand whether a dimension truly performs better in one team than another, one must examine the performance factors.

Figure 5.6: Performance dimensions score for Company A, Department AB.

The performance factors within the four performance dimensions are shown in Figures 5.7 and 5.8. Looking at the first three factors *Goals*, *Roles*, and *Processes* within the *Execution* dimension, Team 1 has a clear advantage in the first two factors, with at least a 4.8% lead over Team 2. The factor *Processes* shows a slight advantage for Team 2 but can be interpreted as approximately equal. Therefore, the dimension can be interpreted as better developed for Team 1.
Looking at the next three factors, *Purpose*, *Trust*, and *Values*, Team 1 is better

than Team 2 in every single factor, although the *Values* factor is only about 3.5% better. Thus, the dimension *Engagement* is clearly better developed in Team 1.
When analyzing the factors *Development Ideas*, *Development Projects*, and *Development Strategy* within the *Enhancement* dimension, Team 1 again takes the lead. Here, the advantage for Team 1 is at least 2.9%. As a result, this dimension can also be seen as better developed within Team 1.
When looking at the last three factors *Financial Results*, *Customer Results*, and *Quality Results* within the *Enforcement* dimension, the results are mixed. Team 1 has an advantage in the *Quality Results* and *Financial Results* factors, but lags behind in the *Customer Results* factor. Although there is only an advantage in two factors and a disadvantage in one, the entire dimension can still be considered better developed for Team 1.

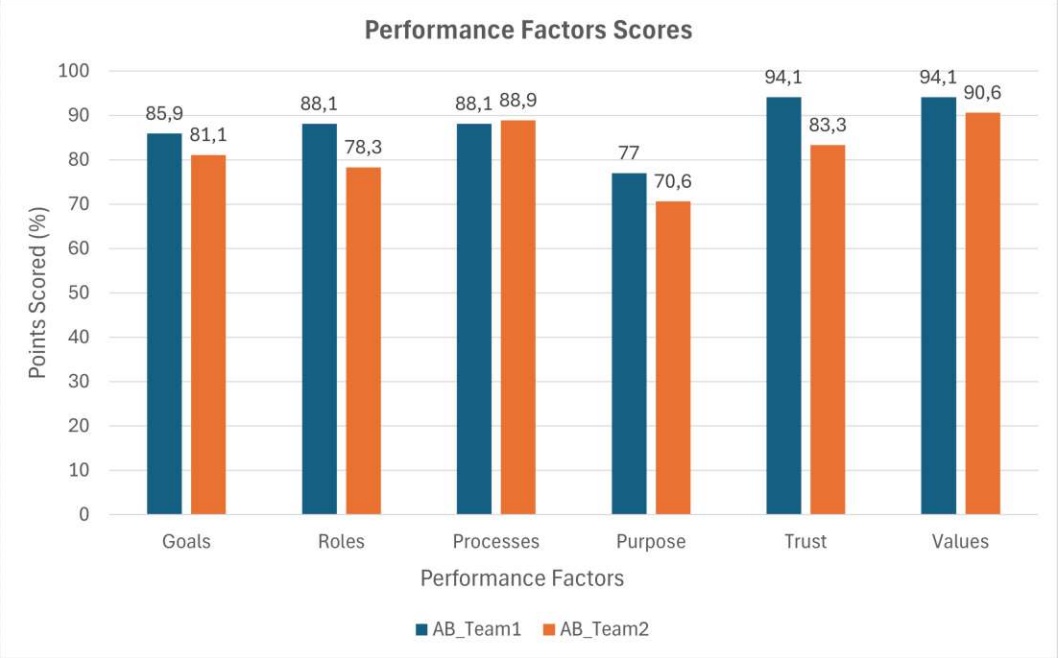

Figure 5.7: Performance factor scores for Company A in the *Execution* and *Engagement* dimensions in Department AB.

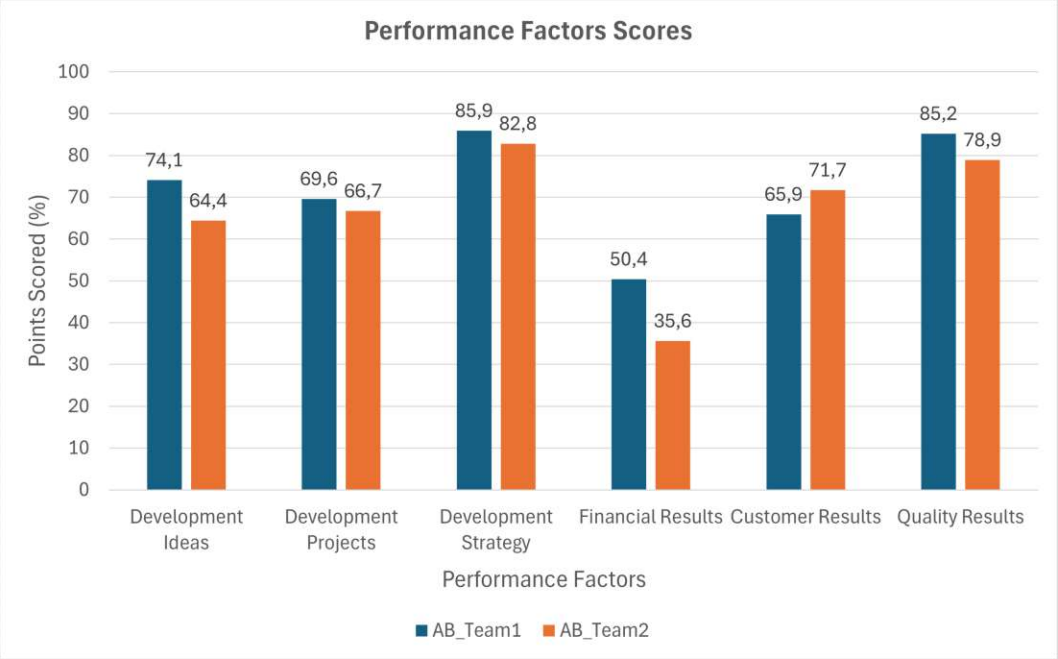

Figure 5.8: Performance factor scores for Company A in the *Enhancement* and *Enforcement* dimensions in Department AB.

The next step is to look again at the performance of the teams, which can be seen in Figure 5.9. The x-axis of the figure represents a part of the fiscal year 2024, segmented by calendar weeks. The y-axis shows the performance score in absolute terms. As described in Section 4.1.1, the company has not defined a target performance level that would represent 100%. Therefore, percentages are not applicable in this context. A higher performance score indicates better performance.

It is evident that Team 2 consistently shows significant higher performance throughout the period. Their performance seems to fluctuate around a score of 100, with a slight upward trend toward the end of the period. In contrast, Team 1 starts with a significantly lower level of performance but gradually improves during the period.

Regarding hypothesis **H1**, it is noteworthy that Team 1 shows significantly better development in all four performance dimensions. Nevertheless, the performance of Team 1 is significantly lower than that of Team 2 throughout the fiscal year. This observation not only fails to support hypothesis H1, but also appears to contradict it.

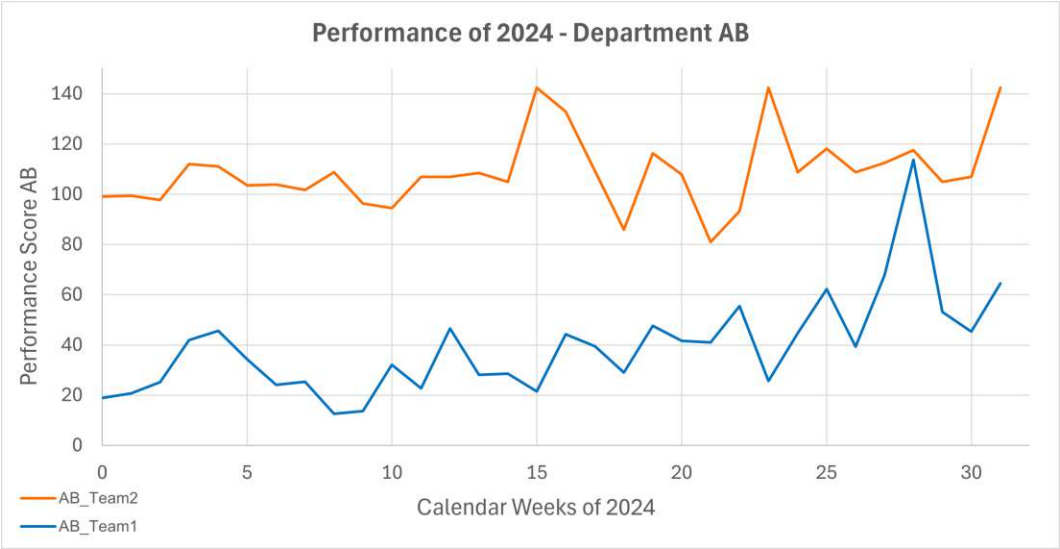

Figure 5.9: Performance Score for Company A in Department AB in the Year 2024.

Therefore, a deeper interpretation of the performance score is required. As described in Section 4.1.1, the score is calculated by dividing the number of tickets received by the number of interactions (responses) required to resolve them. This quotient is then normalized by the number of hours spent and multiplied by 100 to yield a more interpretable value. An examination of the underlying data used to generate Figure 5.9 reveals that Team 1 receives significantly fewer tickets than Team 2 and requires more interactions per ticket to resolve them. In contrast, Team 2 handles a high volume of tickets and resolves them with fewer interactions.
In a follow-up discussion with the company regarding this observation, it was noted that Team 1 was far from operating at full capacity during this period. This may explain the substantial performance gap. It is possible that Team 1 worked less efficiently due to having more time available, whereas Team 2 operated under higher workload pressure. Therefore, a key takeaway may be that such performance comparisons are only meaningful when both teams are working at or near full capacity. In light of this, the apparent contradiction with the hypothesis may be overstated. Accordingly, hypothesis H1 must be considered inconclusive, primarily as a result of contextual limitations.
Moving to hypothesis **H2**, the annual growth rate of the two teams' performance must be examined. This is shown in Table 5.2, where linear trend lines have been created and their growth rates analyzed. As indicated in Table 5.2, Team 1 exhibits a higher growth rate compared to Team 2, while also having a better developed *Enhancement* dimension. Thus, while there is empirical support for Hypothesis H2, it is ultimately deemed inconclusive in light of the contextual limitations previously discussed in relation to H1.

Table 5.2: Annual performance growth rates for Department AB based on linear trendlines fitted in Excel.

Period	Team 1	Team 2
2024	1.361	0.496

When analyzing the last hypothesis **H3**, the mean values of the key figures KF_{H3} for the dimensions and factors must again be taken into account. These are shown as a heat map in Figure 5.10.
Looking at the key figures of the performance dimensions, all four dimensions show higher values for Team 1 compared to Team 2. A similar picture emerges at the level of performance factors, where nine out of twelve factors are in favor of Team 1. However, when comparing these data with the performance shown in Figure 5.9, hypothesis H3 cannot be supported, as Team 1 performs worse than Team 2. Although the contradictory case seems to support the hypothesis, it is inconclusive given the contextual considerations discussed in the H1 analysis.

Dimensions/Factors	AB_Team1	AB_Team2
Execution	3,534	3,121
Engagement	3,693	3,106
Enhancement	2,683	2,474
Enforcement	2,763	2,124
Goals	3,526	3,067
Roles	3,526	2,578
Processes	3,549	3,718
Purpose	2,617	2,565
Trust	4,272	3,123
Values	4,191	3,630
Development Ideas	2,523	2,254
Development Projects	2,087	2,307
Development Strategy	3,438	2,860
Financial Results	1,612	0,503
Customer Results	2,433	2,296
Quality Results	4,431	3,755

Figure 5.10: Heatmap of the mean values of the key figures $KF_{H3}(k = 1)$ across dimensions and factors for Company A, Department AB.

Because the teams were operating at different capacity levels, the results must be interpreted with caution. As a result, the hypotheses are ultimately considered not supported, primarily due to contextual limitations.

5.2 Company B – National Defense Sector

Again, Figure 5.11 presents the observed performance across dimensions for both teams. The y-axis displays the percentage of points scored in each dimension, while the x-axis shows the dimensions in sorted order. In all performance dimensions, Team 1 scored more points than Team 2. The smallest difference is about 1.7% in the dimension *Enforcement* and the largest difference is about 10.2% in *Engagement*. In *Execution*, Team 1 scored about 9.2% higher, and in *Enhancement*, the difference is about 6%.

The range of scores is around 55%-67%, leaving much room for improvement. The lowest dimension in Team 1 is *Enforcement*, leaving an upward potential of about 41.1%. The highest dimension in Team 1 is *Engagement*, leaving a potential of 33.8%.
In Team 2, the highest dimension is *Enforcement* (potential: 41.1%) and the lowest is *Enhancement* at 55.1% (potential: 44.9%).

Figure 5.11: Performance dimension scores for Company B.

In order to better understand whether the difference between the performance dimensions is caused by a single factor pulling the entire dimension up or down, the individual performance factors shown in Figures 5.12 and 5.13 must be examined. This analysis is necessary to determine whether a dimension is truly better developed for one team.

Looking at the first three performance factors *Goals*, *Roles* and *Processes*, within the first performance dimension *Execution*, it can be seen that Team 1 is ahead of Team 2 in every single factor. This gives Team 1 an overall advantage within this performance dimension.
Moving on to the next three performance factors *Purpose*, *Trust*, and *Values*, within the *Engagement* dimension, it is clear that Team 1 is superior by at least 9.2% in each factor. This again indicates that this performance dimension is more developed in Team 1.
For the performance factors *Development Ideas*, *Development Projects*, and *Development Strategy* within the *Enhancement* dimension, all values for Team 1 are higher compared to Team 2, although the difference in the factor *Development Projects* is minimal. However, even if this factor were considered equal, the overall dimension can still be interpreted as better developed for Team 1.
In the final set of performance factors *Financial Results*, *Customer Results*, and *Quality Results*, within the *Enforcement* dimension, Team 1 is no longer clearly superior. The factor *Financial Results* favors Team 2 by 6.4%. Of the remaining two factors, one shows a clear lead for Team 1, while the other can be considered equally developed for both teams. Therefore, no definitive conclusion can be drawn regarding the *Enforcement* dimension, and it should not be interpreted as equally developed.

In summary, it can be said that three of four performance dimensions are better developed in Team 1 compared to Team 2, with most of the performance factors for Team 1 being clearly better or considered equivalent between the two teams.

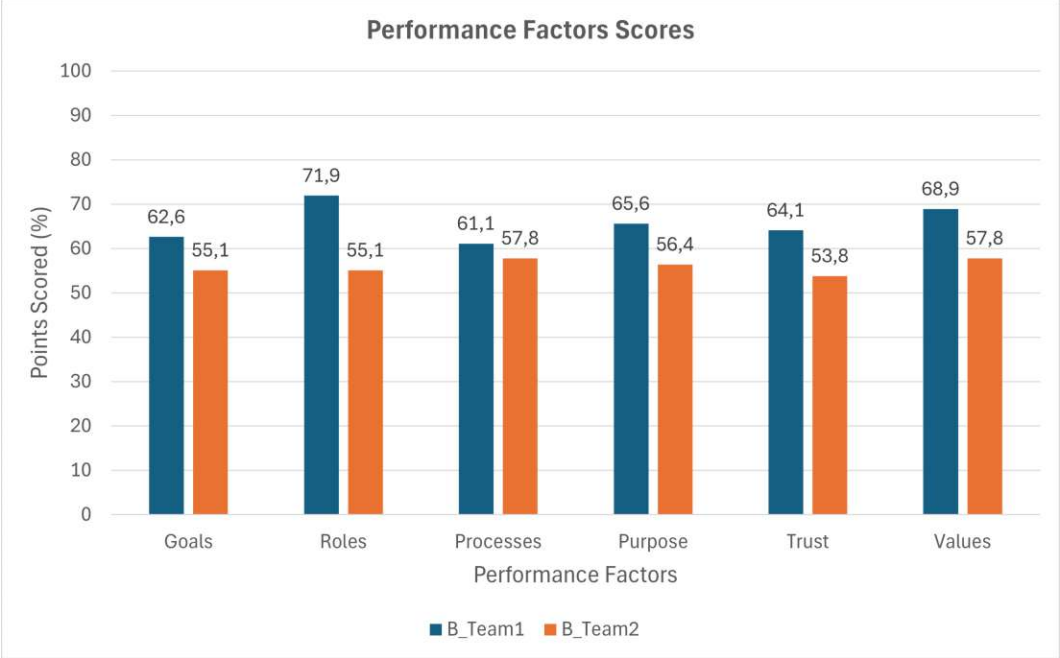

Figure 5.12: Performance factor scores for Company B in the *Execution* and *Engagement* dimensions.

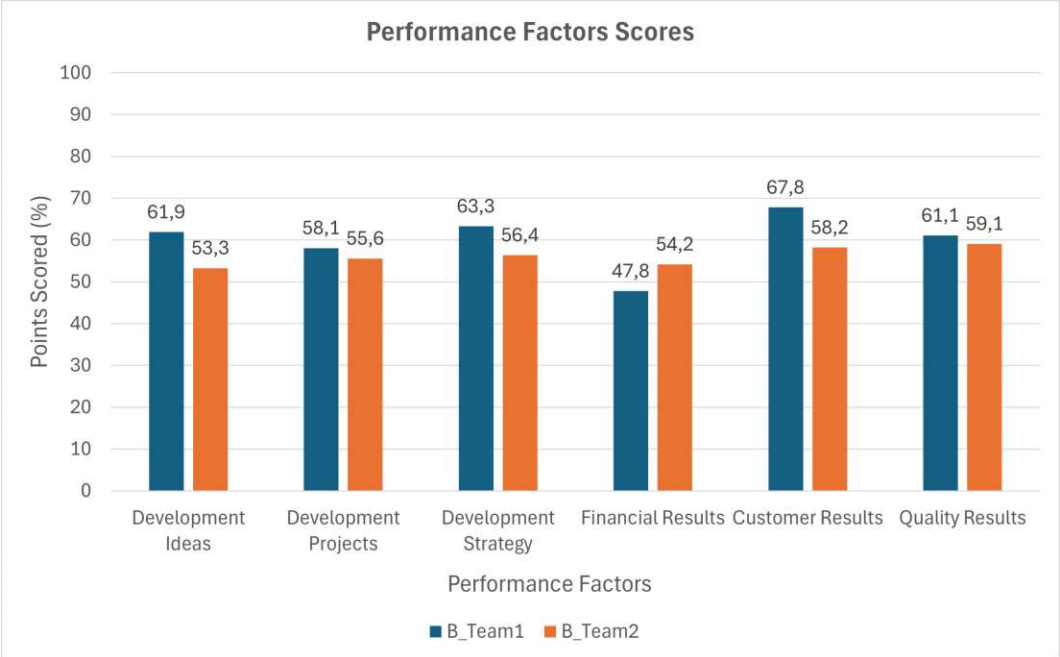

Figure 5.13: Performance factors score for Company B in the *Enhancement* and *Enforcement* dimensions.

The next step is to analyze the performance between the two teams, as shown in Figure 5.14, and relate it to the performance dimension scores in order to examine hypotheses H1-H3 more closely.

In Figure 5.14, the x-axis represents the years 2023 and 2024, while the y-axis shows the performance expressed as a percentage. As shown, Team 1 has achieved more performance in both years, with at least 3.4%, and is therefore closer to the target workload set by the company, represented by the 100%.

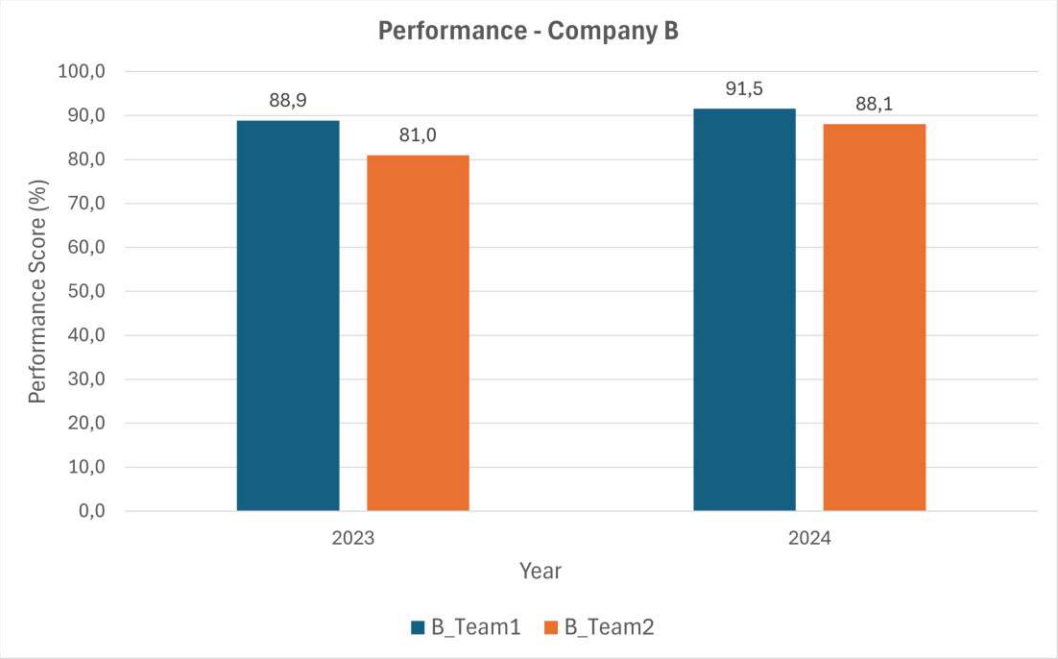

Figure 5.14: Performance of Company B in 2023 and 2024.

Looking at **H1**, the given data support the hypotheses. Team 1 has three of four performance dimensions better developed and also the team performance is slightly better in both years with a higher performance compared to Team 2.

The next hypothesis to be analyzed is whether a higher score in the *Enhancement* dimension is associated with a higher annual growth rate. To evaluate this, the annual growth rates presented in Table 5.3 must be examined. At first glance, the data appear to contradict hypothesis **H2**, as Team 2 shows a higher annual growth rate despite having a lower *Enhancement* score. However, this result should be interpreted with caution, as the comparison is based on only two data points rather than a trendline analysis. Consequently, hypothesis H2 is considered inconclusive, as the available data are insufficient to draw definitive conclusions.

Dimensions/Factors	B_Team1	B_Team2
Execution	2,319	1,953
Engagement	2,487	2,094
Enhancement	2,094	2,035
Enforcement	1,993	2,194
Goals	2,109	1,971
Roles	2,755	1,837
Processes	2,094	2,052
Purpose	2,390	2,017
Trust	2,313	1,960
Values	2,757	2,304
Development Ideas	2,144	1,984
Development Projects	1,921	2,021
Development Strategy	2,216	2,099
Financial Results	1,191	2,032
Customer Results	2,534	2,239
Quality Results	2,254	2,313

Figure 5.15: Heatmap of the mean values of the key figures $KF_{H3}(k = 1)$ across dimensions and factors for Company B.

Table 5.3: Annual performance growth rates for Company B.

Year	**Team 1** (%)	**Team 2** (%)
2023–2024	2.980	8.740

To move on to the next hypothesis, **H3**, one again must look at the means of the key figures of the performance dimensions and factors. Figure 5.15 shows the heat map, where darker colors represent lower key factors within the given dimension or factor. As can be seen, the key factors within dimensions are higher for Team 1 in three out of four dimensions.
Looking at the performance factors, only three out of twelve factors are in favor of Team 2. Team 1 has better performance in both years and the key figures are also bigger in general, indicating that H3 is supported.

5.3 Company C - Plastics Processing Sector

Figure 5.16 shows the different scores for the dimensions for both teams. The x-axis shows the dimensions and the y-axis shows the scores achieved as a percentage of the maximum possible score. When it comes to the *Enforcement* and *Execution* dimensions, it seems that these are more pronounced in Team 2 compared to Team 1. In these two dimensions, Team 2 achieved about 8% more in *Execution* and only about 2% more in *Enforcement*. Team 1 scored

Figure 5.16: Performance dimension scores for Company C.

higher than Team 2 in the dimensions of *Enhancement* and *Engagement*, with the largest difference between the two teams being in *Enhancement*, at around 12%. All in all, it has to be said that the teams scored fairly evenly across the performance dimensions, with no one reaching the 80% mark, living a growth potential of about 37% in the lowest dimension and about 22% in the highest dimension for Team 1, and about 34% in the lowest dimension and about 26% in the highest dimension for Team 2. However, in order to definitively clarify whether a dimension is really better in one team than in another, the individual factors that form the basis for the dimensions must be analyzed again.

The scores for the performance factors within the dimensions are presented in Figures 5.17 and 5.18.
Looking at the performance factors *Goals*, *Roles*, and *Processes*, which fall within the *Execution* dimension, it is evident that Team 2 outperforms Team 1 in all three factors. Therefore, the advantage of Team 2 in this performance dimension is substantial and not merely the result of a single exceptionally high factor inflating the overall score.
Looking at the next factors *Purpose*, *Trust*, and *Values* within the *Engagement* dimension, the factors comparing the two teams are all very close. Therefore, the dimension regarding these three factors is indeed characterized the same in both teams.

The performance factors *Development Ideas*, *Development Projects*, and *Development Strategy*, which can be seen in Figure 5.18 and belong to the *Enhancement* dimension, show a clear advantage for Team 1. Two of the three factors are significantly higher for Team 1 than for Team 2, while the third factor is the same for both teams. Therefore it can be said that the dimension *Enhancement* is clearly better for Team 1 than for Team 2.
When it comes to the last three performance factors *Financial Results*, *Customer Results*, and *Quality Results*, the picture tells a different story. Here, two factors are clearly better for Team 2, but one factor is significantly better for Team 1, which leads to the statement that the dimension Execution should not be interpreted as equal between the two teams, as can be seen in Figure 5.16.

In summary, the dimension *Execution* can be clearly interpreted as better for Team 2 and *Enhancement* as better for Team 1. It can also be said that the dimension *Engagement* is equally characterized in both teams. However, no clear statement can be made about the *Enforcement* dimension.

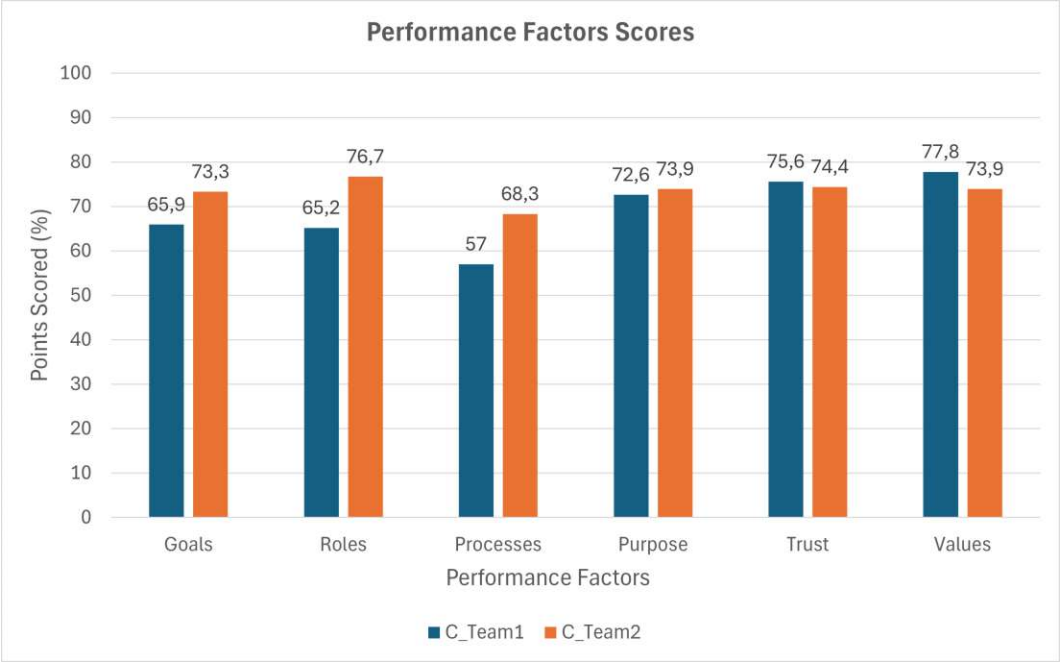

Figure 5.17: Performance factor scores for Company C in the *Execution* and *Engagement* dimensions.

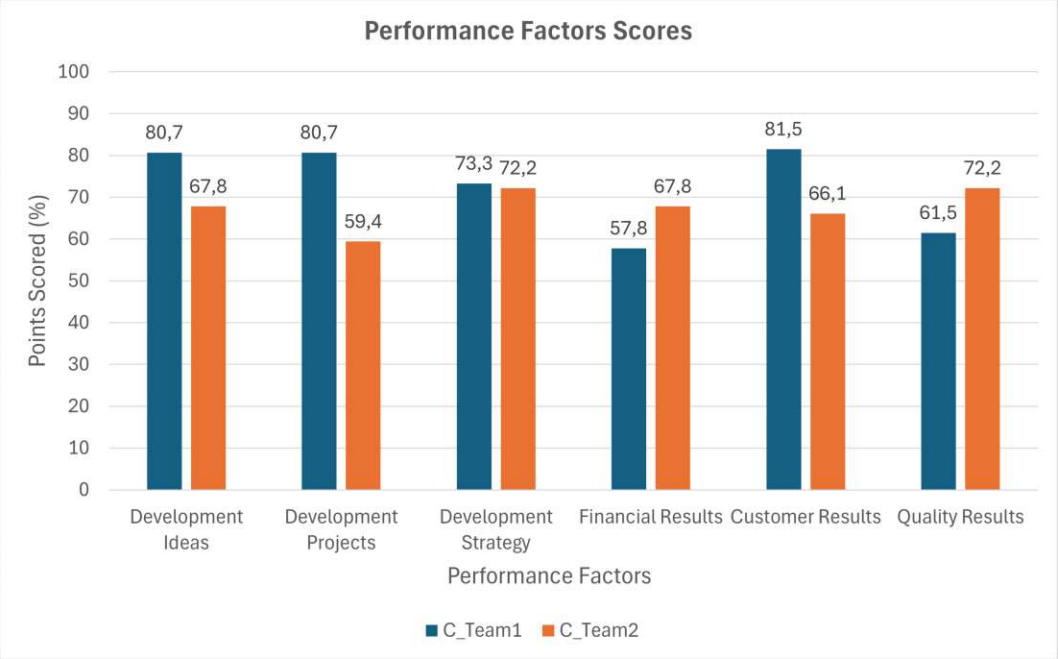

Figure 5.18: Performance factor scores for Company C in the *Enhancement* and *Enforcement* dimensions.

The next step is to analyze the performance of both teams and relate it to the previous analysis of team dynamics to explore the hypotheses. The performance data is shown in Figure 5.19. The first three pairs of bars represent the monthly performance during the first quarter of the fiscal year, while the last pair represents the cumulative performance for the entire quarter. As mentioned in the methodology, the company defines a clear target sales volume for each month. The bars show the actual performance as a percentage of the monthly target. In February and March, Team 2 performs significantly better than Team 1, exceeding the company's target. However, in January, Team 2's performance was significantly lower than Team 1's, resulting in an overall similar performance for both teams over the first quarter. The difference in performance over the quarter gives Team 2 only a slight advantage of 1.3%.

Returning to hypothesis **H1**, no clear trend can be derived from this data because the performance is the same for both teams. Nor is it the case that one team has the clear advantage when it comes to characterizing the performance dimensions or performance factors. This leads to the conclusion that H1 must be labeled as inconclusive. Interesting is that the performance dimensions are very close together giving no clear advantage to any team and also the performance of Q1 beeing nearly the same.
When considering hypothesis **H2**, the *Enhancement* dimension and the per-

formance growth rates, as shown in Table 5.4, must be taken into account. Team 2 shows a strong positive monthly growth rate, while Team 1 shows a mixed development, resulting in an overall negative growth rate for the quarter. However, the *Enhancement* dimension is slightly stronger in Team 1 than in Team 2, which does not support Hypothesis H2, but rather suggests the opposite. Once again, the observed growth rates are not derived from trendline analysis but based on limited data. Therefore, the result must be interpreted with caution, leading to H2 being labeled as inconclusive.

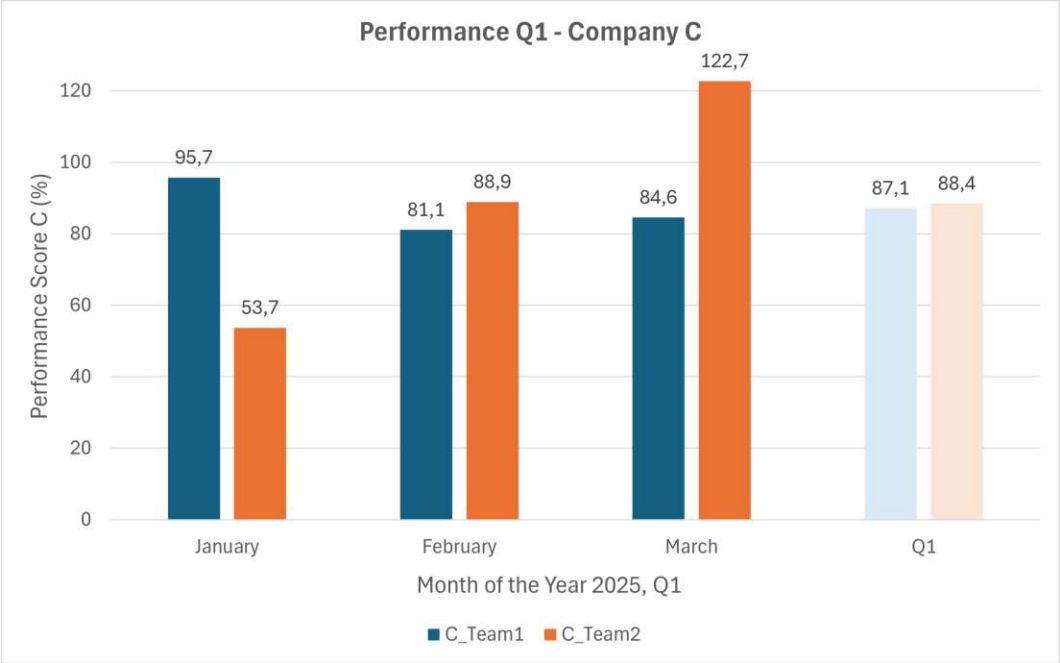

Figure 5.19: Performance of Company C in Q1 of 2025.

Table 5.4: Monthly and quarterly performance growth rates for Company C.

Period	**Team 1** (%)	**Team 2** (%)
January–February	-15.3	65.5
February–March	4.3	38.0
Q1 Total	-11.7	128.5

Looking at the final hypothesis **H3**, the mean key figures of each dimension and factor are analyzed. This is visualized in the heat map in Figure 5.20, where darker fields indicate lower (i.e., worse) values. Each team has two dimensions in which they outperform the other. Team 1 shows an advantage in the *Engagement* and *Enhancement* dimensions, while Team 2 leads in the

remaining two. When examining the performance factors, Team 1 has higher key figures in six out of twelve factors, resulting in an overall tie. This is particularly interesting in light of the equal performance outcome observed in the first quarter.
Each team demonstrates relative strengths in two of the four performance dimensions and achieves equal results across half of the performance factors, no clear pattern emerges that links greater internal uniformity (as measured by the key figures) to superior team performance. The overall balance in both uniformity and performance, especially in Q1, suggests that H3 is inconclusive.

Dimensions/Factors	C_Team1	C_Team2
Execution	2,084	2,964
Engagement	3,086	2,739
Enhancement	3,011	2,386
Enforcement	2,308	2,554
Goals	2,128	3,141
Roles	2,302	3,170
Processes	1,824	2,582
Purpose	3,023	2,611
Trust	2,843	2,845
Values	3,393	2,760
Development Ideas	3,029	2,626
Development Projects	3,196	1,745
Development Strategy	2,808	2,786
Financial Results	1,708	2,427
Customer Results	3,280	2,400
Quality Results	1,935	2,835

Figure 5.20: Heatmap of the mean values of the key figures $KF_{H3}(k = 1)$ across dimensions and factors for Company C.

To summarize the chapter, the results across the three hypotheses are inconclusive, with some indications of support. In several cases, the data suggest potential support for the proposed relationships, based on the best available and most reliable subsets of the data, while in others, limited data quality and contextual limitations prevent any firm conclusions. Importantly, no hypothesis was labeled as contradicted, as the available data and contextual limitations do not justify such a classification. To provide a clearer overview of the evaluation, Table 5.5 summarizes each hypothesis, indicating the number of times it was supported, found to be inconclusive, or contradicted during the analysis.

Table 5.5: Overview of Hypothesis Support Based on Data Analysis.

Support Status	**H1**	**H2**	**H3**
Supported	2	1	2
Inconclusive	2	3	2
Contradicted	0	0	0

Chapter 6

Conclusion

The purpose of this thesis was to evaluate whether the Value Chain Model is a suitable alternative to existing models of team performance. In order to do this, different models for describing team performance were analyzed and compared theoretically. The starting point was an exploration of what constitutes a ”good” model and what criteria should be considered when evaluating one. This began with a more philosophical perspective, leading to the conclusion that a model always consists of a trinity: the target system, the model itself, and the user who applies the model for a specific purpose. This implies that a model is not inherently better just because it represents the target system more accurately.

It was further established that, ideally, a model should both fit well with the target system (target system fit) and be useful for the intended application (user-purpose fit). The concept of target system fit was then linked to the ideas of underfitting and overfitting, with bias and variance serving as key explanatory factors.

The next step was to examine the concept of team performance. The results indicate that team performance cannot be assessed solely on the basis of outputs, but that inputs must also be taken into account.

A literature review of existing team performance models was then conducted. These models were generally found to fall into two categories: those that prescribe a specific sequence of actions or factors to enable team performance (framework-focused models), and those that present a broader set of interdependent factors without a prescribed order (factor-focused models). However, a phased approach is often impractical in a real-world work environment. In such an environment, a leader must perform multiple actions simultaneously. While detailed interdependencies between factors may be useful from a scientific perspective, they may be too complicated for real-world application. This can lead to a poorer cognitive understanding of the concept. The Value Chain Model seems to strike a good balance between these two approaches, offering a middle ground between factor-focused and framework-focused models, with

reasonable performance in terms of usability due to the performance factors included. Furthermore, it neglects the complicated interdependencies between factors, such as feedback loops, and also forgoes a phased logic, which provides more flexibility.

To further examine the fit between the target system and the model, three hypotheses **H1**, **H2**, and **H3** were developed and are presented at the end of Section 3.2.7. Data were collected from three companies, including a total of four different team pairs. This was done by providing the companies with an online questionnaire, completed by each team member, to explore the characterization of the performance dimensions and factors of the Value Chain Model within the teams. In addition, performance data provided by the companies was used to generate performance scores. The data was analyzed descriptively to explore the hypotheses. The results are inconclusive with some indications of support:

- **H1** was supported twice and inconclusive twice.
- **H2** was supported once and inconclusive three times.
- **H3** was supported twice and inconclusive twice.

These findings reflect the exploratory nature of this work. Rather than providing conclusive validation, the thesis provides insights and a basis for further investigation into the applicability and usefulness of the Value Chain Model for describing team performance.

Chapter 7

Limitations and Outlook

One of the major limitations of this thesis is the timing of the questionnaire. It was administered once, after the period during which performance data were collected. Although participants were instructed to reflect on the relevant period while responding, retrospective self-assessments likely differ from assessments made during the actual period. A longitudinal design, in which the questionnaire is completed multiple times during the performance period, would likely provide more reliable findings.
In addition, the performance data provided by the companies were limited in quantity and quality, preventing the use of rigorous statistical tests. Therefore, the results of this thesis should be interpreted with caution. Rather than seeking conclusive results, this study should be viewed as an exploratory effort that identifies potential directions for future research.
Future research could take a long-term approach, involving multiple organizations and repeated data collection over extended periods of time. This would allow the use of more advanced statistical methods, such as multifactor analysis, to better assess the impact of performance dimensions and factors on team outcomes.
In addition, this thesis focused on the performance dimension of the Value Chain Model. Further testing could include the leader perspective, incorporating personality traits, leadership mindset, and leadership skills that influence leadership behavior.

Appendix A: Questionnaire

Performance Dimension	Performance Factor	Question
Execution	Goals	We in the team know the goals of the team and the goals of each other.
Execution	Goals	The team has a clear process for setting and communicating goals.
Execution	Goals	We in the team are satisfied with how well the goals are communicated and understood within the team.
Execution	Goals	Team members' goals are aligned throughout the year and with the overall team goal.
Execution	Goals	There is a process for determining when and where individual performance contributions are aligned with the overarching goal.
Execution	Goals	The team is satisfied with the alignment of individual and team goals.
Execution	Goals	Team members focus on achieving the goals and prioritize their tasks accordingly.
Execution	Goals	Team members have translated the goals into specific tasks for themselves.
Execution	Goals	The team is satisfied with its focus on relevant goals.
Execution	Rules	There are clearly defined and distinct roles in the team that avoid duplication of effort and misunderstandings.
Execution	Rules	There is a process in the team to ensure that roles and responsibilities are regularly reviewed and adjusted as necessary.
Execution	Rules	The team is satisfied with the distribution and delineation of roles and responsibilities.
Execution	Rules	Team members have a clear understanding of their roles, responsibilities, decision-making authority, and what is expected of them.
Execution	Rules	Roles and responsibilities are regularly clarified and adjusted within the team.

Performance Dimension	**Performance Factor**	**Question**
Execution	Rules	The team is satisfied with the clarity of roles and associated responsibilities.
Execution	Rules	Team members have the necessary skills and expertise in their roles to successfully perform the tasks required to achieve the team goal.
Execution	Rules	The skills of team members are systematically assessed as needed and developed through task adjustment, feedback, and training.
Execution	Rules	We in the team are satisfied with the fit of our individual skills to our roles and the available development opportunities.
Execution	Processes	The team has clearly defined work and meeting processes that each team member knows and understands.
Execution	Processes	Processes are a high priority in our collaboration, are well documented, and are regularly optimized and adapted.
Execution	Processes	We are satisfied with the clarity of our work and meeting processes.
Execution	Processes	Our work and meeting processes are designed to contribute effectively to the achievement of our goals.
Execution	Processes	We regularly discuss the effectiveness and impact of our work and meeting processes and how we can adapt them.
Execution	Processes	We, as a team, are satisfied with the impact of our work and meeting processes on the achievement of our goals.
Execution	Processes	The team has technology tools and systems that support our work and meeting processes and make them more efficient.
Execution	Processes	At least once a year, the IT tools and systems we use are systematically reviewed and adapted to the needs of our work processes.
Execution	Processes	We in the team are satisfied with how the available systems and tools facilitate our tasks.
Engagement	Purpose	The team has clear goals and tasks that are perceived as relevant and meaningful to achieving a greater whole.
Engagement	Purpose	As a team, we often discuss the meaning and purpose of achieving our goals.
Engagement	Purpose	We in the team find the team's goals and tasks understandable, meaningful, and relevant.

Performance Dimension	**Performance Factor**	**Question**
Engagement	Purpose	The team's mission and goals touch us emotionally and align with our personal beliefs and values.
Engagement	Purpose	We regularly charge our vision and goals with emotion, for example, through emotional images or stories.
Engagement	Purpose	We team members are fully committed to what we do.
Engagement	Purpose	Within the team, the efforts, contributions, and successes of individual team members are regularly highlighted and recognized.
Engagement	Purpose	Team members receive regular, constructive feedback and know who is important to the completion of their tasks.
Engagement	Purpose	We in the team are satisfied with the level of recognition we receive for our work and successes.
Engagement	Trust	Team members interact regularly and know each other well.
Engagement	Trust	Positive working relationships and team building are regularly promoted in our team.
Engagement	Trust	As a team, we are satisfied with the quality and frequency of our interactions.
Engagement	Trust	We team members are also interested in the "person" behind the role and feel valued and accepted.
Engagement	Trust	We support each other; the tone in the team is always full of respect and appreciation for the other person.
Engagement	Trust	We team members are proud to be part of the team and share the feeling of being in the same boat.
Engagement	Trust	There are no rumors in the team; decisions, goals and challenges are communicated openly.
Engagement	Trust	There are no taboos in the team; conflicts are accepted, discussed promptly and openly, and resolved constructively.
Engagement	Trust	The team is satisfied with how openly and clearly information, decisions, and personal opinions are shared.
Engagement	Values	All team members actively participate in decision-making processes and daily work.
Engagement	Values	Team meetings make sure that everyone has a voice.
Engagement	Values	We in the team are satisfied with the opportunity to actively participate in decisions and processes.

Performance Dimension	**Performance Factor**	**Question**
Engagement	Values	Our team views mistakes and failures as opportunities for growth and development.
Engagement	Values	We in the team address difficulties directly and actively, and come up with ideas and suggestions for solutions.
Engagement	Values	We are satisfied with the way we use mistakes and failures as learning opportunities and continuously learn from each other.
Engagement	Values	There is a common understanding and realistic expectations among all team members regarding performance levels, work hours, punctuality, and standards of excellence.
Engagement	Values	In our team, individual contributions to results are transparent and discussed regularly.
Engagement	Values	Team members are satisfied with the balance between productivity and pressure and with the performance standards maintained within the team.
Enhancement	Development Ideas	The team identifies opportunities and market or technology trends that may affect the organization.
Enhancement	Development Ideas	We analyze and discuss relevant trends in the external environment in a structured way in order to evolve.
Enhancement	Development Ideas	We in the team are satisfied with how well the team is informed about market trends and technology changes.
Enhancement	Development Ideas	Team members continuously identify opportunities for improvement within the organization.
Enhancement	Development Ideas	We systematically examine our internal strengths and weaknesses.
Enhancement	Development Ideas	Team members are satisfied with the team's awareness of our strengths, weaknesses, and internal performance potential.
Enhancement	Development Ideas	Team members respond quickly to opportunities and new possibilities for innovation and improvement.
Enhancement	Development Ideas	We systematically and regularly generate new ideas and opportunities.
Enhancement	Development Ideas	Team members are satisfied with the team's ability to seize opportunities and generate development ideas.
Enhancement	Development Project	The team has clear criteria for deciding which development ideas to pursue.

Performance Dimension	**Performance Factor**	**Question**
Enhancement	Development Project	We systematically review the criteria needed to make decisions about innovation and growth projects.
Enhancement	Development Project	Our team members are satisfied with the criteria used to make decisions about innovation and growth projects.
Enhancement	Development Project	Our team evaluates innovation and development ideas in a timely and effective manner.
Enhancement	Development Project	We systematically and regularly evaluate and decide on new opportunities and development ideas.
Enhancement	Development Project	Our team members are satisfied with how the team evaluates, prioritizes, and acts on new opportunities and development ideas.
Enhancement	Development Project	Our team invests resources in the most promising development projects.
Enhancement	Development Project	We have clear policies and processes for selecting promising development ideas and allocating the necessary resources to pursue them.
Enhancement	Development Project	Our team members are satisfied with the investment in development projects.
Enhancement	Development Strategy	Team members are ready and willing to accept change.
Enhancement	Development Strategy	Our team regularly communicates the strategic relevance, necessity, or urgency of changes.
Enhancement	Development Strategy	We team members are satisfied with the understanding and acceptance of changes in the team.
Enhancement	Development Strategy	The implementation of projects is professionally prepared by a clearly defined strategy with goals, roles, structures and processes.
Enhancement	Development Strategy	Goals, structures, and processes are adjusted in response to changing conditions or priorities.
Enhancement	Development Strategy	The team is satisfied with the structured and efficient approach to project implementation.
Enhancement	Development Strategy	Before projects are implemented, measures are planned to promote cohesion, acceptance and involvement of all stakeholders.
Enhancement	Development Strategy	Communication before and during projects is well planned and ensures clarity for stakeholders.
Enhancement	Development Strategy	We in the team are satisfied with the way we and the affected parties are motivated and involved in projects.

Performance Dimension	**Performance Factor**	**Question**
Enforcement	Financial Results	Team members pay attention to the financial performance of the team and are regularly informed about the current financial figures.
Enforcement	Financial Results	Key financial performance indicators are regularly collected and communicated within the team.
Enforcement	Financial Results	Team members are satisfied with how well the team monitors and manages financial performance.
Enforcement	Financial Results	The team members manage financial means and resources responsibly and monitor their compliance.
Enforcement	Financial Results	There is a clear process for planning, monitoring, and adjusting budgets, resources, and costs.
Enforcement	Financial Results	Team members are satisfied with how we manage budgets, resources, and costs within the team.
Enforcement	Financial Results	As a team, we respond quickly and accurately to new financial information and make the necessary changes.
Enforcement	Financial Results	When financial data deviates from expectations, we take corrective action and develop targeted strategies to correct the situation.
Enforcement	Financial Results	Team members believe that actions taken in response to financial data are timely and appropriate to improve financial performance.
Enforcement	Customer Results	Team members understand the current needs of their internal and external customers.
Enforcement	Customer Results	Our team systematically and regularly gathers customer feedback and data and analyzes it for action.
Enforcement	Customer Results	Team members are satisfied with the team's understanding of internal and external customer needs.
Enforcement	Customer Results	Team members communicate regularly with their internal and external customers and network partners.
Enforcement	Customer Results	Our team has clear guidelines for managing and maintaining relationships with internal and external customers and network partners in order to strengthen and maintain these relationships.
Enforcement	Customer Results	Our team members are satisfied with the team's overall approach to developing and maintaining relationships with internal and external customers and network partners.
Enforcement	Customer Results	Analysis of customer feedback is immediately translated into observable and immediate actions.

Performance Dimension	**Performance Factor**	**Question**
Enforcement	Customer Results	As a team, we have clear guidelines on when and how to take customer feedback, derive improvement actions, and integrate them into workflows and decision-making processes in a timely manner.
Enforcement	Customer Results	Team members take pride in the fact that customer feedback leads to meaningful improvements in a timely manner.
Enforcement	Quality Results	Team members adhere to established workflows and procedures to ensure effective and efficient completion of tasks.
Enforcement	Quality Results	Our team's processes support the efficiency of our operations and ensure the timely and high quality delivery of our products and services.
Enforcement	Quality Results	Our team members feel well supported by the existing workflows to deliver high quality products and services in a timely manner.
Enforcement	Quality Results	Team members use existing tools and IT systems to professionalize their work.
Enforcement	Quality Results	There are up-to-date and efficient tools and IT systems that effectively support work processes and achieve the best possible results.
Enforcement	Quality Results	Team members feel well supported by the available tools and IT systems, which enables us to work efficiently and achieve excellent results.
Enforcement	Quality Results	Our team quickly identifies deviations from quality targets and takes immediate corrective action.
Enforcement	Quality Results	As a team, we systematically and regularly discuss and communicate process and system quality issues.
Enforcement	Quality Results	We team members are satisfied with the clarity, consistency and communication of quality standards within the team.

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