CHALMERS
UNIVERSITY OF TECHNOLOGY

Performance measurement and management at a Swedish manufacturing company

Master’s thesis in Quality and Operations Management
Master’s thesis in Management and Economics of Innovation

Axel Romnéus Westberg
Oliver Brink

DEPARTMENT OF TECHNOLOGY MANAGEMENT AND ECONOMICS
DIVISION OF INNOVATION AND R&D MANAGEMENT

CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2026
www.chalmers.se

Performance measurement and management at a Swedish manufacturing company

Axel Romnéus Westberg
Oliver Brink

CHALMERS
UNIVERSITY OF TECHNOLOGY

Department of Technology Management and Economics
Division of Innovation and R&D management
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2026

Performance measurement and management at a Swedish manufacturing company

Axel Romnéus Westberg
Oliver Brink

Department of Technology Management and Economics
Division of Innovation and R&D Management
Chalmers University of Technology
SE-412 96 Gothenburg
Sweden
Telephone + 46 (0)31-772 1000

Gothenburg, Sweden 2026

Performance measurement and management
at a Swedish manufacturing company

Axel Romnéus Westberg
Oliver Brink

Department of Technology Management and Economics
Chalmers University of Technology

SUMMARY
Today, performance measurement and performance management practices permeate all types of industries and are frequently recommended to enhance organizational performance. The purpose of this thesis is to evaluate how performance measurement and performance management can be assessed within the departments of an organization, so that the organization can understand where efforts need to be made to facilitate implementation of desired practices and effectively use its performance measurement system to evaluate the performance of the organization.

A small manufacturing company was the subject of the thesis. Using the framework of interplay between performance measurement, performance management, employee engagement and performance by Smith and Bititci (2017), four departments of the company were assessed in their levels of maturity in performance measurement - also named technical control - and performance management - also named social control - respectively. This was done by interviewing and surveying employees at the company, collecting data relating to the criteria proposed by Smith and Bititci (2017) in technical and social control.

By developing empirically derived maturity matrices for technical and social control practices within the company, the respective maturity levels within the individual departments were assessed. Overall, the product department shows the highest maturity in both technical and social control. Managerial implications include addressing the lack of employees’ connection to measures and targets as well addressing the lack of allotted time for feedback and performance reviews. The thesis contributes to existing theory by providing a tangible way to assess technical and social control between organizational units, able to be used both by managers and in future research alike.

Keywords: performance measurement, performance management, benchmarking, employee engagement, performance indicators, manufacturing, SME, automotive

Acknowledgements

Our thesis was conducted during the fall of 2025, at the division of Innovation and R&D Management at the department of Technology Management and Economics at Chalmers University of Technology. There are several individuals whom we would like to acknowledge, all for having made this thesis possible.

We would like to thank our supervisor and examiner Hendry Raharjo, for his extensive feedback and support. Through our discussions with him, he has continuously steered us in the right direction and enabled us to produce this body of work.

We would also like to thank every single employee at the company in question for our study, for being welcoming and helpful towards us and letting us take up their time for interviews. Without your contribution, our thesis could not have been conducted. Special thanks go to the CEO, who was instrumental in helping us find areas to explore. Thank you for letting us perform our work in your organization. We hope that our findings bring value to your managerial efforts.

Finally, we thank our opponent, Julia Brinkhagen, for providing valuable feedback.

Axel Romnéus Westberg and Oliver Brink, February 10, 2026

Table of Contents

Acknowledgements vii
1. Introduction 1
  1.1 Background 1
  1.2 Organizational context 2
  1.3 Purpose 2
  1.4 Research Questions 3
  1.5 Delimitations 3
2. Theory 4
    2.1 Performance measurement and management 4
    2.2 Assessment of Performance Measurement Systems 5
    2.3 Assessment of Performance Management 5
    2.4 Employee Engagement 5
    2.5 The interplay between social and technical control 6
    2.6 Technical control criteria 6
    2.7 Social control criteria 8
3. Method 10
  3.1 Research process 10
  3.2 Research design and methods 10
  3.3 Data collection and analysis 11
    3.3.1 Interviewing 11
    3.3.2 Survey 12
    3.3.3 Analysis of data 12
  3.4 Research quality 13
  3.5 Ethical considerations 13
4. Results 15
  4.1 Technical Control – Performance Measurement 15
    4.1.1 Warehouse 16
    4.1.2 Workshop 18
    4.1.3 Sales 20
    4.1.4 Product 22
    4.1.5 Summary of technical control results 24
  4.2 Social control - Performance Management 26
    4.2.1 Warehouse 27
    4.2.2 Workshop 31
    4.2.3 Sales 35

4.2.4 Product 40
4.2.5 Summary of social control results 44
4.3 Employee Engagement 46
4.3.1 Warehouse 46
4.3.2 Workshop 46
4.3.3 Sales 46
4.3.4 Product 47
4.3.5 Employee Engagement Score 47
4.4 Combined results 47
5. Discussion 49
5.1 Technical control 49
5.2 Social control 50
5.3 Academic contribution 52
5.4 Managerial implications 53
6. Conclusion 55
6.1 Research Questions 55
6.1.1 Research Question 1 55
6.1.2 Research Question 2 55
6.2 Limitations 55
6.3 Future research 56
References 57
Appendices 61
Appendix A. Survey Questions 61
Appendix B. Swedish-English translations 63
Appendix C. Interview questions in Swedish 65

1. Introduction

This chapter introduces the background and problem statement for our study, including purpose, research questions and delimitations.

1.1 Background

Today, the use of performance measurement and performance management practices permeates all types of industries, both in the private and public sector. These are frequently recommended to facilitate strategy implementation and enhance organizational performance (Davis & Albright, 2004).

Performance measurement systems (PMS) consist of using financial as well as non-financial performance measures (KPIs) that are linked to an organization's business strategy (Franco-Santos et al., 2012). Performance management, on the other hand, encompasses the cultural and behavioral aspects of an organization that are related to how an organization is controlled, managed and perceived by the employees (Smith & Bititci, 2017).

It has been shown that the performance measurement system and performance management are interrelated, and a change in one dimension might relay a change in the other. For example, increasing the maturity of the PMS might then decrease the performance management in the organization (Smith & Bititci, 2017).

Moving on, since departments in an organization have different tasks and work-flows performance measurement systems must be tailored to their specific context (Franco-Santos et al., 2012). Furthermore, the cultural aspects in an organization might differ from department to department. Therefore, to understand how a company operates in terms of performance measurement and management, it can be valuable to evaluate it at different departments, levels or locations, instead of an aggregated level of the whole organization. Since the task of improving the PMS and culture is managerial in nature a need for prioritization might occur. Therefore, it might be valuable to assess the maturity of each department to allow for well-informed prioritization.

Assessing the departments and comparing them is a form of benchmarking. Benchmarking is the comparison of performance data of similar processes or activities (Alderman & Murray, 2025). Benchmarking is important to objectively measure performance, and through comparisons learning can be facilitated (Garvin, 1983; Oliver, 1994). One way of benchmarking could be to use maturity matrices (Bititci et al., 2015; Van Aken et al., 2005; Wettstein & Kueng, 2002).

Furthermore the research on performance measurement systems in SMEs is limited (Heinicke, 2018). But, the research that exists suggests that performance measurement systems have a positive impact and can assist managers in their daily work (Heinicke, 2018).

1.2 Organizational context

The company investigated in this thesis is a supplier of used and refurbished components and mechanical parts. Headquartered in Sweden, it supplies its products across Europe. Under the definitions of the European Union (European Commission, 2020) the company is defined as an SME – specifically a small enterprise – having less than 50 employees and less than €10 million in turnover.

During the last year, the company has seen a lot of changes in leadership and organizational structure. The CEO has expressed a need for ways to be able to handle current and anticipated challenges related to company growth. One important aspect of this concerns decentralization of management; according to the CEO, to be able to grow, the different departments of the company need to be more self-governed, while still making sure that they follow the general strategies and goals set by the management team.

To this end, there is an expressed interest in improving performance measurement by implementing a set of KPIs (i.e. measures) for each department that, when properly implemented and continuously tracked, will ensure alignment with company strategy and goals. The intended outcome is that implementing and tracking these selected KPIs would mean that the department managers can be given more freedom to govern their own processes. The CEO would have less need to get involved in the details of each department when it can be trusted that the managers properly use performance measurement practices towards the targets within selected KPIs.

However, to be able to implement the KPIs, there is a need to map out the current landscape of performance measurement within company departments, assessing their level of maturity when it comes to the implementation of performance measurement practices. Some departments have performance measurement as a core part of their processes, while others are lacking in this area, preventing them from following up on their own trends to adjust their processes. Naturally, what is optimal in terms of performance measurement implementation may vary by department, due to the different nature of their tasks. But correctly understanding the current extent of performance measurement and management is required to ensure that the management team of the company focuses its future measurement implementation efforts in the right places, instead of somewhere where measures are already being used to the desired extent.

1.3 Purpose

The purpose of the thesis is to assess the level of maturity of the individual departments of the company in regard to performance measurement and management. The intended outcome is for the management team of the company to be able to use the findings to facilitate their efforts in implementing measures across the departments, enabling the company to become more decentralized, and ultimately reducing the challenges that arise with company growth.

To be able to assess the maturity of performance measurement and management, it is first required to understand how such an assessment can be conducted. As such, to fulfil the purpose above, previous research needs to be studied to understand what frameworks can be used and what criteria are important to consider for an accurate assessment. Practical application of such a framework creates academic value by enabling future research to utilize similar methods when measuring maturity in other settings, and for other organizations to use similar methods when trying to assess their own departments.

1.4 Research Questions

Drawing on the purpose, the thesis aims to answer the following research questions:

1. *What to consider when assessing the maturity level of performance measurement and performance management?*
2. *What is the maturity level of each department of the company in question with respect to performance measurement and performance management?*

1.5 Delimitations

It is up to the management of the company to decide what to do with the information that they gain through the authors' assessment of maturity in the different departments. The thesis will not consist of performing any intervention to implement KPIs, instead leaving this to the management team of the company.

There is a possibility that not every important criterion regarding performance measurement and management is able to be assessed within the scope of this thesis. Some criteria may potentially be difficult to assess due to the limited time frame of the work or due to data collection methods being unavailable to the authors. This depends on the circumstances at the company in question and nature of the selected framework and its suggested criteria. However, the aim is to be as exhaustive as possible, attempting to measure every important criterion possible to measure given the time frame of the work, subsequently aggregating them to assess the overall maturity.

2. Theory

This chapter describes the theoretical frameworks that are applied in this study. It lays the foundation for how we choose to apply and interpret the theory that we use to develop our results and discussion.

2.1 Performance measurement and management

The literature of performance measurement and management has been developed throughout the years. Neely et al., (1995) defined a performance measurement system as a set of performance measures, where a performance measure is a "metric used to quantify the efficiency and/or effectiveness of an action". In the same decade, Kaplan & Norton (1992) constructed the balanced score card and argued that companies needs to create performance measurement systems that gives a holistic view of the company's performance. Furthermore, it has been argued that if the performance measurement system is not correctly maintained it might lead to sub-optimization, through continuously adding new and not removing obsolete measures. (Douwe P. Flapper et al., 1996).

While these articles focused on the performance measurement system specifically, others have researched how it affects people. While performance measurement systems might on one hand positively affect people's behaviour, they might also create biases and create perceptions of unfairness, especially if they are used for performance evaluation (Franco-Santos et al., 2012).

Over time, literature of performance measurement has evolved into performance management. Moving from research of how and what to measure, to how to use the measures to improve the performance of an organisation (Bititci et al., 2015). There has also been critique that there has been little understanding on how to use the existing theory to support performance measurement practices (Bititci et al., 2015)

To tackle this, several recent articles have been rethinking what performance measurement and management is from new theoretical lenses, and argued that there is an interplay between technical and social control (Mackenzie & Bititci, 2024, 2023; Pavlov & Micheli, 2023). Through this they have defined performance measurement as practices that give a consistent assessment of the effectiveness of organisational practices, while performance management is defined as social: "The social processes of sensemaking, interpretation, judgement, and decision-making conditioned by organisational behaviour that influence those elements of organisational practices open to flexible interpretation by agents and change the effectiveness of organisational practices"

Based on another theoretical lens, Smith and Bititci (2017) describes the interplay between performance measurement and performance management, and in an earlier work argued that there needs to be a balance between technical and social control when controlling an organization, to optimize organizational performance (Bititci, 2015, pp. 133–135). This is further illustrated in the next section.

2.2 Assessment of Performance Measurement Systems

There is literature on how to assess performance measurement systems. Bititci et al. (1997) argued for using a reference model built based on "industry best practice" to audit existing performance measurement systems. Medori and Steeple (2000) instead used a six-stage plan together with a list of performance measures, through which a company would select the suitable measures based on the success factors of the company, with periodic maintenance to keep the performance measurement system up to date.

Other studies have used maturity models, where the performance measurement is graded using matrices defining different levels of maturity for selected dimensions (Van Aken et al., 2005; Wettstein & Kueng, 2002), or criteria which the system needs to fulfil (Speckbacher et al., 2003). The use of maturity models has been shown to speed up the assessment of performance management systems, and facilitate ownership in the management team through enabling discussions about the performance measurement system when used by the management (Bititci et al., 2015)

Furthermore, some studies claim that framework for self-assessments needs to be adjusted for SMEs and have therefore developed tools to do just that (Cocca & Alberti, 2010; Garengo, 2009).

2.3 Assessment of Performance Management

Job Diagnostics Survey (JBS) and Job Characteristics Inventory (JCI) are two similar tools that were created to increase employee motivation and productivity. The authors describe that by changing characteristics of the work, engagement could be increased (Hackman & Oldham, 1975; Sims et al., 1976). These tools were then improved upon with the Multimethod Job Design Questionnaire (MJDQ) (Campion & Thayer, 1985). Later, Morgeson and Humphrey (2006) created the Work Design Questionnaire (WDQ) criticising JDS for being too narrow and MJDQ for missing important factors, such as autonomy. WDQ then was created to bridge this gap and combine other literature to build a more comprehensive measure with 21 work characteristics.

2.4 Employee Engagement

In his paper (Saks, 2019) explores the antecedents of employee engagement. He conceptualizes employee engagement as comprising two dimensions: job engagement and organizational engagement. Job engagement refers to the extent to which individuals are engaged in their specific roles, while organizational engagement reflects how engaged they are with the organization as a whole. The author further argues that higher levels of employee engagement benefit organizations by, among other outcomes, increasing organizational commitment and reducing employees' intention to quit.

2.5 The interplay between social and technical control

Smith and Bititci (2017) suggest a framework to model the relationship between performance measurement and performance management and their effect on employee engagement as well as organizational performance. Through their study they showed that by increasing the maturity of performance management, and thus also inadvertently reducing the maturity of performance measurement, the employee engagement was increased and as well as the performance of the teams.

Here, technical control refers to *"rational, planned, bureaucratic and structural elements of the organization"*. Social control on the other hand "*focus on emergent, cultural and behavioral aspects of the organization"*. The technical dimension ranges from low to high maturity, while the social control dimensions ranges from *"command and control"* to *"democratic and participative"* (Smith & Bititci, 2017).

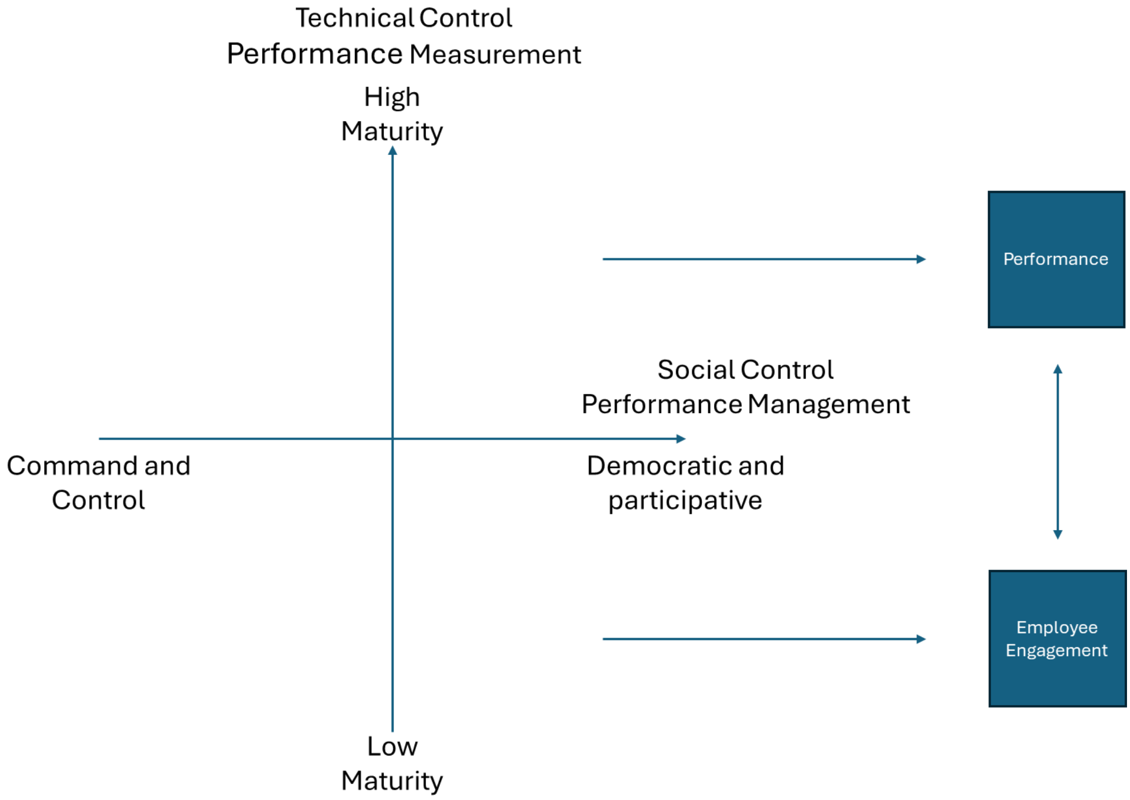

Figure 1 The interplay between social and technical control (Smith & Bititci, 2017)

2.6 Technical control criteria

Smith and Bititci (2017), specify that a mature performance measurement system should: include "*a balanced set of strategic measures*"; include a high degree of "*awareness of the cause-and-effect relationships within the measurement system"*; include "*incentives that link with strategic objectives and plans"*; "*deploy high-level strategic measures to lower levels through local* *measures and targets*"; "*ensure that managers with the right span of accountability and control are responsible for the metrics*"; "*report measures and their trends in an accessible manner*"; and, "*exercise short interval control through frequent reviews of performance reports*". These criteria are summarized in Fig 1. Below we present clearer definitions of these criteria as they are used in this thesis.

Balanced set of metrics / Financial or fragmented set of measures

According to Bischof, Pfeiffer, & Speckbacher (2003) a balanced set of metrics entails, at the minimum, using both financial and non-financial metrics to measure the performance of an organization. It can also include creating what is known as a balanced scorecard, a tool to provide holistic view of measurement, that has historically included various perspectives (Speckbacher et al., 2003).

High degree of awareness of the causal relationship / Little degree of awareness of the causal relationship

The degree of awareness of the causal relationship refers to employees' and managers' abilities to understand and connect implemented measurements to the strategy expressed by the company (Speckbacher et al., 2003), as well as the relationships between the measurements and performance, and, potentially, financial results (Smith & Bititci, 2017).

Strategic measures are deployed to lower levels / Strategic measures are not deployed to lower levels

According to this criterion, "*The objectives of deployment … are to ensure that … Performance measures used at various levels of the organization [should] reflect the business objectives and policies*" (Bititci et al., 1997). An example would be that if a company has its strategy and business model reliant on speed in its processes, a measurement utilized within a warehouse department could include delivery time.

Targets and incentives link to strategic objectives / Targets and incentives do not link to strategic objectives

This criterion means that potential targets and incentives set within the various departments of an organization should be set through metrics that are connected to strategy (Speckbacher et al., 2003). In the case of targets/incentives being set at the local level, this criterion has a connection to strategic measures being deployed to lower levels; if strategic measurements are not deployed to lower levels, there are no strategy-connected measures to set targets and incentives by. Hence, low maturity in this aspect could mean either that the targets and incentives are based on measurements that are not linked to strategy, or that targets and/or incentives are lacking all-together. Group- or team-based rewards that link to strategic outcomes are associated with more mature performance measurement systems (Eisenhardt, 1985; Ittner, 2008).

Managers with the right span of accountability and control / Managers do not have right span of accountability and control

For the metrics that are implemented, it should be clear who has responsibility for what metric, both in terms of who performs the measurements and who is held accountable if goals are not reached within the specified metric. Additionally, it should be within the power of the assigned manager to affect the outcome of the metric through their own actions. If a manager cannot affect the metric, accountability serves no purpose (Bititci, 2015).

Measures and their trends are reported in an accessible manner / Measures and their trends are not reported and not accessible

A high maturity means that there is a low barrier for employees to access and view metrics data, making it easy for them understand, follow and learn from measurement trends (Barnes & Walker, 2010).

Regular and frequent performance reviews / Performance reviews – not regular or in response to an emergency

The time interval between performance reviews for implemented measures should be established, regular, and frequent, to be able to continuously follow up on metrics and use them to steer the organization/department in the right direction. Having irregular reviews that are connected to specific circumstances or emergencies is a sign of low maturity (Bititci, 2015).

Short interval control

Short interval control refers to the time between measurements of specified metrics. "*The assumption is that if a process needs to be controlled, the more often that data relating to the performance of the process are collected the more opportunities there are to identify issues and to intervene to improve performance"* (Wilson, 2004).

2.7 Social control criteria

In the framework by (Smith & Bititci, 2017) a democratic organization consist of several factors: *"job enrichment and multiskilling, autonomy and self-management with loose controls; participation and industrial democracy, psychological safety; appreciating differences and being open to new ideas; and creating time for idea sharing and reflection"*. A command and control-organization would consist of the opposite of these factors. While they have not in all cases clearly defined what these criteria mean, we are here presenting the criteria as we use them.

Job enrichment and multiskilling

Job enrichment and multiskilling here is based on two components: task variety and skill variety. That is, the variety of tasks and skills an employee are tasked with respectively using in their work. A high level of these are believed to increase the engagement by making the job more interesting and enjoyable (Morgeson & Humphrey, 2006).

Specialization and demarcation of work

Specialization and demarcation refers here to two different aspects: to job complexity – that is, to what extent multiple high-level skills are needed – and specialization, meaning the depth of knowledge needed to complete the tasks (Morgeson & Humphrey, 2006).

Autonomy and self-management with loose controls

Autonomy and self-management with loose controls refers to the individual employee's power to govern over the choice of methods, their schedule and make their own decisions (Morgeson & Humphrey, 2006),

Participation and industrial democracy

Participation and industrial democracy is connected to the employees possibility to influence their workplace and can be defined as: *"the exercise of power by workers or their representatives over decisions within their places of employment, coupled with a modification of the locus and distribution of authority within the workplace"* (Poole et al., 2001).

Psychological safety

Psychological safety was first researched in the context of team learning by Edmondson (1999). She showed that to facilitate learning within teams, greater psychological safety is needed. She further explains that to be psychologically safe the team members must feel that they can admit to mistakes, challenge assumptions and that members need to feel safe to take interpersonal risks, meaning that the members are free from embarrassment or punishment when, for instance, bringing up errors that they have made.

Appreciating differences and being open to new ideas

Appreciating differences and being open to new ideas measures the degree of openness for new ideas and influences. Higher maturity corresponds to a higher tolerance and acceptance of new ideas as well as continuous seeking after improvement opportunities.

Creating time for idea sharing and reflection

Creating time for idea sharing and reflection is the process within teams for detecting and correcting errors and finding improvement opportunities. A higher maturity would mean that a team work systematically and with engagement and high degree of responsibility for finding improvements opportunities.

Internal competition

Internal competition is the competition within teams. Internal competition might be either beneficial and detrimental to a company depending on contextual factors, and it might also be a consequence of using performance measurement (Luft, 2016). In the framework internal competition is seen as being on the "command and control" side of social dimension (Smith & Bititci, 2017)

Reward and Punishment

Reward and punishment is measuring the maturity of the reward and punishment structures in the organization. A low maturity would indicate unclear and inconsistent performance evaluation and punishments for poor performance, whereas a high maturity would mean transparent and fair performance evaluation, and that poor evaluation is addressed through feedback and training.

3. Method

This chapter presents our chosen method for the study, including the process, design, and considers the ethical considerations.

3.1 Research process

The project consisted of various stages, outlined below. To gather the input required to come up with our conclusions, our main sources of data include conducting interviews and performing surveys.

Firstly, to gain an introductory understanding of the company and their operations, the authors went on site visits, conducted observations along with semi-structured and unstructured interviews. Primarily, interviews at this stage were held with employees at the highest management level. Among other things, these interviews divulged the current goals, strategies and future aims of the company.

To accurately measure the technical and social control within the different departments of the company, the departments needed to be assessed on the different criteria for each type of control, as specified by of (Smith & Bititci, 2017). To this end, interviews were conducted with all employees in the various departments of the company. The interviews were semi-structured. Assessing some of the criteria also included a survey, to ensure that employees were comfortable expressing their honest opinions.

The interviewing phase lasted 3 weeks, while the survey was distributed during the last day of the interviewing phase. The survey was distributed to all present employees at site and collected the same day. For employees not present that day, a digital survey with the same questions was sent out and collected the following days.

Finally, after the data collection phase, the data was analyzed and used to assess the maturity levels of performance measurement and management across the departments.

3.2 Research design and methods

This research is a case study, but the research has elements of cross-sectional design. We are comparing the different departments with each other using both qualitative data from semi-structured interviews and quantitative data from surveys. The interview data was collected over the course of a few weeks while most of the survey data was collected the same day.

The questionnaire and interview questions were originally generated deductively based on the theory from Smith & Bitici (2017). But to fit this specific context and scenario the survey and interview questions were revised inductively.

3.3 Data collection and analysis

All employees including the management participated in the interviews and responded to the survey.

3.3.1 Interviewing

Each employee was interviewed once with a similar set of questions. The interviews ranged between 20 to 60 minutes. Most of the interviews were conducted on site, but a few of them were conducted digitally.

Table 1 Overview of conducted interviews

Department	Length (minutes)	Type	Date
Management	20	Digital	2025-09
Management	26	Digital	2025-09
Management	43	Physical	2025-10
Product	41	Digital	2025-11
Management	45	Physical	2025-11
Management	46	Physical	2025-11
Management	25	Physical	2025-11
Sales	37	Digital	2025-11
Management	28	Digital	2025-11
Sales	34	Digital	2025-12
Sales	44	Physical	2025-12
Warehouse	18	Physical	2025-12
Warehouse	23	Physical	2025-12
Warehouse	20	Physical	2025-12
Workshop	48	Physical	2025-12
Sales	46	Physical	2025-12
Workshop	20	Physical	2025-12
Workshop	27	Physical	2025-12
Workshop	29	Physical	2025-12
Sales	44	Digital	2025-12
Product	40	Physical	2025-12
Product	53	Physical	2025-12
Product	21	Physical	2025-12
Management	40	Digital	2025-12
Management	28	Digital	2025-12

The interview questions were modified between sessions to make sure that the questions were relevant to the interview subjects' respective department and rephrased if found that the questions were misunderstood. To give the interviewee the possibility to reflect on the questions beforehand, we sent the interview questions to them before the interview. The questions were sent at least 24 hours in advance, but in most cases several days before the interview occurred.

The interview questions concerned primarily criteria of technical control, with a few questions regarding social control to add qualitative data to complement the survey.

3.3.2 Survey

Each employee was given a survey to fill out. Most of them filled in a paper-based survey, but some of them filled in an identical but digital version. The survey questions concerned only criteria of social control. The survey consisted of answering on a scale of 1 to 7 – from completely disagree to completely agree – how much they agree with the statements presented in the survey. These statements are available in appendix A

3.3.3 Analysis of data

The interview data was first transcribed and then coded. The survey data was analyzed by first dividing the answers into the different departments and then taking an average of the score for each question, while also considering the standard deviation and the maximum and minimum scores within each department.

The data was then used to construct two matrices, one for technical control (performance measurement)(Table 2) and one for social control (performance management)(Table 4) In these matrices, each criterion in Smith and Bititci (2017) contains a spectrum of requirements, creating an assessment scoring system. This was developed empirically based on the data, to create a spectrum which represented practices and circumstances found within the company. Smith and Bititci (2017) do not define any set of requirements for each criterion in their study themselves. Instead, basing the requirements empirically on interview data enabled us to construct a scale of maturity suited to the circumstances at the company, to clearly show the differences between the departments.

Each criterion was evaluated to a score between 1 and 5. Taking the average for all criteria gave each department an overall maturity in technical and social control individually. The maturity levels of 1, 3, and 5 were specified. If the department was deemed to only partially reach up to the requirements in 3 or 5, the criterion was evaluated to a score of 2 or 4, respectively.

3.4 Research quality

Most of the questions used in the interview are taken from previously published research. In that way, the questions have already been tested for internal reliability. While the original items are in English, we translated them into Swedish to ensure they were correctly understood by all employees, who were all native Swedish speakers.

To ensure the validity of the data, we compared the data from the interviews and the surveys. Since the company in question is relatively small, we were able to collect data from all employees, including the management.

To minimize bias and add nuance to the evaluation, each of the authors first scored each criterion for each department individually, without looking at the score set by the other. After scoring individually, the authors discussed and evaluated each criterion again together, jointly setting the final score for reach criterion in each department.

To establish a foundation for replicability all the survey and interview questions are listed in the appendix, and our methods are described in this chapter.

Consideration was taken to balance the number of interview questions and the survey questions. On one hand, expanding the number of interview questions and survey questions could have provided more data that could be used to assess the departments' maturity levels. On the other hand, too many questions risk lowering the quality of the data, since employees might, for example, start getting stressed about their working tasks for the day or get tired of spending time answering questions. The sets of questions we devised set to strike a balance between these two considerations.

3.5 Ethical considerations

We have taken several ethical considerations during the research process. To begin with, harm has been avoided by creating a calm and relaxed environment for the interviews, by for instance offering coffee, food and plenty of time allotted for the interviewee. We made sure to be in a separate room to avoid being overheard and to eliminate distractions. Furthermore, we have taken measures to maintain the anonymity of the participants as well as the company, by generalizing some statements to remove specific information that could lead to identification.

All the participants were informed by us and their manager about our project. They were informed about and consented to being recorded during the interviews and were also informed that the surveys were given an identification number to be used only by us researchers.

The privacy of the participants was protected by keeping the questionnaire and interviewing questions relevant to the research. Questions about previous employment were asked only to give us researchers a context on who we were interviewing, but the data was not used in the research and will be discarded.

On the topic of data, all participants have been informed that research data will be kept until the research project has been completed. Measures to maintain data integrity have been taken, by keeping the data only on internal networks and encrypted hard drives.

No willful deception of the participants has been performed. The company as well as the participants have been informed when the aim and goal of the research has been changed. No changes were made once the data collection phase began.

Lastly, LLM-models have been used to improve the grammar, language and flow of the text in this article. But it has not been used in any other way.

4. Results

This chapter presents our findings, assessing the performance measurement and performance management practices at the company across its departments by applying the matrices developed. Four of the company's departments are evaluated: warehouse, workshop, sales, and product. These are the main operational departments of the company.

4.1 Technical Control – Performance Measurement

Here follows the matrix describing criteria of technical control, showing the requirements needed to achieve the set level of maturity for each criterion. The four departments are assessed by applying this matrix to the data collected from the interviews.

Table 2. Maturity matrix for Technical Control

Criterion	**1**	**3**	**5**
Balanced set of metrics/ Financial or fragmented set of measures*	Lack of any evident measures in the department	Either only financial or only non-financial measures are used and expressed by employees within department (excluding manager)	Both financial and non-financial measures are used and expressed by employees within department
High degree of awareness of the causal relationship / Little degree of awareness of the causal relationship	Neither employees nor the manager can make a connection between their own department's measurements and the company's stated strategic goals	Manager shows an understanding of the connection between their own department's measurements and the company's stated strategic goals. Employees understand on a general level why the measurements are useful, but not the explicit connection to the company's goals.	Both manager and employees have an explicit understanding of the connection between their own department's measurements and the company's stated strategic goals
Strategic measures are deployed to lower levels / Strategic measures are not deployed to lower levels	Local representations of overarching strategic goals and measures (from the business plan) are non-existent in the department	The department has one local representation of strategic goals and measures, understood by employees. These can be either completely new or formed from dividing strategic measures into categories/groups. Other local measures may be present, but their connection to strategy is unclear.	At least three local measures are present, connected to the strategic measures.
Targets and incentives link to strategic objectives / Targets and incentives do not link to strategic objectives	No specific targets or incentives are present.	One specific target or incentive is present but not necessarily linked to strategic objectives.	At least two specific targets and/or incentives are present, connected to strategic objectives, and provides direction to the work of the employees.
Managers with the right span of accountability and control /	Managers do not feel like they have the power to affect the outcome of the measures in their department	Managers feel in control and accountable for the measures in their department	Managers feel in control and accountable for the metrics in their department. Furthermore, there exists measures that are the responsibilities of non-manager employee(s)

Managers do not have right span of accountability and control			
Measures and their trends are reported in an accessible manner/ Measures and their trends are not reported and not accessible	Employees cannot or are unaware of how to access reports of metrics in their own department	Employees can access metrics for their own department on their own, but may have to go about it in a roundabout way	Employees can easily access metrics for their own department, and additionally has access to at least some metrics of at least some other department
Regular and frequent performance reviews / Performance reviews – not regular or in response to an emergency	Performance reviews (concerning the whole department) are non-existent or very rare, and/or do not evaluate measures at the department.	Performance reviews are conducted, but are either informal, irregular, or do not address implemented metrics at the department	Performance reviews are conducted regularly, proactively (as opposed to reactively), and explicitly evaluates the measures at the department.
Short interval control**	Measurement intervals are irregular or rare.	Measures within the department are measured once a month	Measures in the department are measured more often than once a month.

* In the company, there is a central excel document used to track measurements across departments. In this excel document, measurements are reported every month by managers (and in some cases employees). The document contains a wide range of measures for all departments, a lot of which are never mentioned by employees. However, it is expressed by management that some measures in the document are obsolete; some are not reported anymore, and some are reported just from old habits but not followed up on. For this reason, only measures expressed by employees will contribute to the requirements of the criterion *Balanced set of metrics*, so that the evaluation is based on what affects the department in practice.

** Similarly, only measures which are expressed by employees will be evaluated in this criterion.

4.1.1 Warehouse

Balance of metrics & Awareness of causal relationship

In the warehouse, there is a general lack of awareness of how the department works with KPIs and numbers. Asking about goals in general in the department yields some examples: "*I suppose that would be keeping down faulty deliveries, as they are very costly*". However, when asked about whether this is something that they measure in the warehouse, answers include *"I don't look at it myself"* and similar expressions. Thus, they seem unaware whether any metrics are used to track or direct the work of the warehouse, and by extension what connection these would have to company strategy.

From the manager (who is also the manager of the workshop), it is revealed that the inventory value is measured, but this is not used to direct the work of the department. There are other things that the manager would want to track as well: *"...we could implement stock level [tracking] [...] we could have a couple of bars, for example KPIs on a dashboard showing stock levels per stock keeping unit [...] we have a set revenue goal [in the company], and if we can't keep our stock levels up we cannot sell."*

Balance of metrics Score: 2. Justification: While inventory value is being measured, it is expressed only by employees outside the department and the manager.

Awareness of causal relationship Score: 2. Justification: Manager shows a connection to the measure, but since employees do not mention the measure, the awareness to the causal relationship is also lacking.

Strategic measures deployment to lower levels

No local measurements relating to strategic measures are observed.

Score: 1.

Targets and incentives linking to strategic objectives

No specific targets or incentives are identified by the employees in the warehouse. However, from other departments we know that "*We have a goal of no more than X SEK in inventory value"*.

Score: 2. Justification: There is a specific target of a maximum inventory value. However, their score is lowered due to little awareness of it among warehouse employees.

Managers' accountability and control

The manager feels responsibility for the targets and metrics on an aggregate level and feels like he has the ability to affect them, but examples of such metrics are only given for the workshop department.

Score: 2.

Reporting of measures and their trends

The manager has access to some KPIs from other departments, but may have to ask other managers for specifics. *"It isn't something that's actively being communicated".* For the rest of the employees, only one of them has access to some statistics, but there seems to be an overall lack of interest in tracking numbers. When asked whether they can access metrics from other departments if they want to: *"No. That's not something that's important to our department".*

Some numbers relating to their department and others may at times be presented during company-wide meetings. *"During our common [Friday] meetings, they usually [present metrics]. But it's more so the overall picture of the whole company"; "Primarily we go over [metrics] during conferences".* The conferences mentioned are company-wide events, usually held a few times a year.

Score: 2. Justification: Specific employees have access to metrics for their own department, but there is a lack of interest. The rest are unable or unaware of how to access them and need help from other employees if they are interested.

Frequency of performance reviews

Performance reviews in relation to numbers appear to be essentially non-existent. Asking if they ever analyze or follow up on their metrics *"I'm not sure [...] I can't quite remember honestly [...] doesn't really affect me."; "On a scale of 1 to 10, it's a 1".*

Score: 1.

Interval control

While employees within the warehouse department do not mention it, employees in other departments say that "*Currently, we check the value of our inventory every other week*". However, the inventory value does not directly affect the work of the warehouse, but rather mostly affects the product team.

Score: N/A. Justification: Routine for inventory value control, but not by the warehouse department.

4.1.2 Workshop

Balance of metrics

While the mechanics of the workshop work closely with the warehouse, they have a clearer picture in their mind of what is being measured compared to the average warehouse worker. The metrics include both financials and non-financials: "*We do cost analyses. How much time a [refurbishment] took [to complete]. The parts we used". "If they sell the [product] for a particular price we want X % contribution margin". "We measure the frequency of complaints".*

Time is reported by each mechanic by logging whenever they start and stop their work on a part. From the point of view of the mechanics, it seems to be working well, but from the manager's and the product team's perspective, it is difficult to get any good results from the data. "*The [time] metrics that are measurable are quite lacking".* The distribution between the times spent on even the same types of products is wide, meaning it is hard to pinpoint problem areas.

Score: 4. Justification: Financials and non-financials are present, but the non-financial (time) has problems with measurements.

Awareness of causal relationship

While the mechanics are aware of what is being measured, in general they do not consider the connection between these KPIs and the specific strategy of the company. They can mostly only speak in general terms of the benefits of measuring them. [*"Q: Do you know if these metrics are connected to the company's strategic goals?"] "I think so. I should hope so [...] they need to make money from their products". "The cost of a complaint is very high. [A complaint] means that all of the profit [of the order] is gone".*

Score: 3. Justification: Employees understand in general why the measurements are useful.

Strategic measures deployment to lower levels

As previously mentioned, cost analysis (taking into account time taken, parts used) is done per order, resulting in a more granular, local measurement for each order, connecting to the company's profitability goal.

Score: 3. Justification: Local measure includes cost analysis per order/part.

Targets and incentives linking to strategic objectives

Some measurements include specific targets. "…w*e want X % contribution margin." "We have a target to get down a certain percentage of complaints".* These connect to the overarching goals of the company. However, not everyone seems to be aware of the targets. This may be in part because whether targets are reached or not generally does not have a direct bearing on the work of the mechanics. "*It doesn't make my day any different".*

Score: 4. Justification: Two targets are present, but they do not seem to direct the work of the employees.

Managers' accountability and control

Managing the metrics consists of "*A close dialogue together with purchasing and product".* Different people are responsible for different metrics. The manager feels accountable for the workshop as a whole. *"[If production output is unsatisfactory] we start looking at what is taking time […] a lot of different factors that can affect the time of the work, so then we proceed and eliminate [the factors]".*

Score: 3. Justification: Manager feels in control and accountable.

Reporting of measures and their trends

Similarly to the warehouse workers, the interest in seeing available statistics seems quite low, especially numbers from other departments. *"I feel like it doesn't really affect me. I just work".* The mechanics are mostly unaware of what numbers they have access to right now. "*No idea. It isn't something that I've tried to get a hold of". "We have Friday meetings, sometimes they bring up some numbers there".* The manager is the same person as for the warehouse, having access to some KPIs but having to ask other department managers for specifics.

Score: 2. Justification: Many employees are unaware of how to access, and the ones who know have to go about in a roundabout way.

Frequency of performance reviews

Performance reviews are very rarely performed, both in the sense of individual performance and team performance. "*I think it's very rare [regarding feedback]… you don't get to know anything… I think it's unfortunate, because it could be very good to know…. You could learn a lot from that."*

Score: 1.

Interval control

Cost analysis is performed and available to view for each product, and aggregated monthly in the excel. But mechanics do not have access or are unaware of their access to the excel, so the final cost is not being looked at by the mechanics. "*If you wanted to you could go into an old ID and check that particular cost analysis. But no one does that*". It's more of interest to the product team. "*We look at the cost analyses a lot. That's why it's important that [the time measurement] is correct*" (Product team employee).

Score: 3. Justification: Measurements are aggregated monthly.

4.1.3 Sales

Balance of metrics

In the sales department, a variety of different metrics are present and measured. *"When it comes to sales we look at the number of request for quotations, number of offers…rate of conversion… revenue [differentiated] on renovated, accessories, and used [products]"… The response time [when customers are calling]. "Lead time [between requests and responses]".* Regarding how much they are actually measuring, the sentiment varies among employees. *"Within sales, we are really bad at [measuring]".*

Score: 4. Justification: Although both financial and non-financial are used there is an expressed sentiment that they are not fully used.

Awareness of causal relationship

For an understanding of the causal relationship, there is a general understanding of the benefits of the measurements, but the direct link to company strategy is sometimes less clear. *"[We measure response times and conversion rates] to have a good offer towards our customers". "To ensure we maintain a consistent and high quality […] helps us to identify … if there are any bottlenecks or processes that need to change". "Our revenue goal is directly connected [to the business plan]. Now, I don't know exactly what it says in the business plan, but we have a revenue goal."*

Score: 4. Justification: Overall, the data supports that the employees understand the connections to the strategic goals, even if they are unaware of specifics in the business plan.

Strategic measures deployment to lower levels

Several of the measurements within sales are mentioned in the business plan as part of bigger goals (e.g. response times, conversion rate). As per quotes above, revenue, with its explicit goal specified in the business plan, is also divided into various group categories.

Score: 5.

Targets and incentives linking to strategic objectives

There are no clear incentives for employees to reach any particular target. Performing well does not have any specific benefits other than self-satisfaction. *"It's always nice [to reach goals] but it doesn't affect me personally whether [they are reached or not]". "As an individual you enjoy having goals to target, and of course that leads to a certain satisfaction"* There are targets specified in the business plan, such as certain amounts sold to specific customer groups, but these targets do not seem to be known by the sales employees and are not directly connected to the measures expressed by employees.

Score: 2. Justification: There are targets set in the business plans, but they do not seem to affect the employees nor connect to the used measures in the department.

Managers' accountability and control

The manager of the department is new, and regarding metrics says that *"We haven't really begun with the work surrounding it. Because it's one thing to measure but another to actually take action".* Currently, instead of affecting the operations of the sales team directly, "*the outcome of the analyses [of the metrics] has more so been on the side of the product team, who then has to work on the advertisements and the prices of our products."*

Score: 2. Justification: While managers is new, they feel in control and clearly have extensive plans for their department. However, currently, systems are not in place for the manager to utilize performance measurement.

Reporting of measures and their trends

Each salesperson is able to see metrics within the department. *"Many metrics can be viewed in [internal reporting software], where you can create your own dashboard and see results". "We have an excel document [monthly statistics for the whole company] with KPIs." "On Friday meetings we go through other things but sometimes [metrics] show up a bit there as well."*

Score: 5. Justification: Personal and team metrics are available to view, and the excel document can be used to view metrics from other departments.

Frequency of performance reviews

The department has a newly assigned manager, who has a clear vision for what their aim is for implementing a more direct way of using KPIs to direct the sales operations. However, currently there exists very little joint effort on following up on the measures, even though the numbers are present and able to be tracked. *"We don't currently have any structured process surrounding it. But there will be… getting more used to working with KPIs and following up on them. We've always looked at them, because we want to know how well we perform, but never really taken any actions based on [the numbers]".*

Score: 1. Justification: As of now, the data gathered suggests that performance reviews occur very rarely.

Interval control

In the previously mentioned excel document, several metrics are reported every month. However, there is very little involvement from employees in this. *"I don't know. [Management] are the ones looking at it … We don't take part in it, but it's not something we've asked for anyway"*. Metrics mentioned by employees are aggregated in the excel document monthly.

Score: 3. Justification: The excel document is filled out every month for measures expressed.

4.1.4 Product

Balance of metrics

The product team has a variety of metrics implemented. *"…so we measure value of inventory, because it's an important number. Then we have the delivery lead time, since that's the counterweight to inventory value … we also measure complaints, there we measure cost of complaints and complaint rate." "Repurchase rate after complaints".* There are specific targets, and the employees are aware of the targets*. "We have a goal of no more than X SEK in inventory value. And we want a contribution margin of over Y %"*

Score: 5. Justification: Various metrics, both financial and non-financial.

Awareness of causal relationship

While not everyone may be aware of the reasoning behind the specific target numbers, such as why maximum inventory value is set at a maximum of X SEK, there is still an understanding of how it connects to the overall strategy of quality and growth. "[*We measure] to understand profit, quality and risk, but also to be able to manage the product range … A high and stable contribution margin, a healthy inventory value and low complaint rate is key for the strategy of the company and its sustainable growth".*

Score: 5. Justification: Employees express a clearly understood connection to strategy.

Strategic measures deployment to lower levels

The contribution margin and complaint rate can be further broken down from the overall rate. "*For the complaint rate, we measure by product groups, dividing the [products] into product families, so that we can catch … if there's anything specific with these groups that creates problems … you can go down into the details." "We look a lot at the cost analyses… the duration [of the work] and we check the spare parts that are needed [for different products]… If they are expensive we can start looking for better purchasing alternatives."*

Score: 5. Justification: Several measures are broken down to local levels for the product team.

Targets and incentives linking to strategic objectives

"We have a goal of no more than X SEK in inventory value. And we want a contribution margin of over Y %" The contribution margin is clearly connected to the overall profit goals of the company. For complaint rate, *"We have a target to get down to a certain percentage when it comes to the complaint rate and the repurchase rate after complaints".* This is part of the company's goal in quality. Employees express different opinions in regards to whether reaching the goals or not affects them: *"[My work] is not especially affected";"[My work situation] is the same regardless. I'd say that's both good and bad. It creates a safe working environment";"[When goals are reached] I get a more stable working day with more time for structure, documentation and proactive development … [When goals are not reached] the amount of urgent tasks, unplanned problems… and more pressure on sales, purchasing and product".*

Score: 5. Justification: There are at least two clear targets that are connected to strategic objectives, directing the work of the employees.

Managers' accountability and control

Responsibilities for individual metrics are divided amongst the team members, clearly creating a sense of accountability for the targets they want to achieve. *"There is always one person who has main responsibility for one area"*
One example: *[My position means] being responsible for all complaints, the metrics on complaints rate, repurchasing after complaints… and at the same time product development in response to products where complaints always occur. That we remedy [the product] or educate ourselves to avoid further complaints"*. The team can use the results to discuss internally and steer the product range in the right direction. "*For a decision to be passed, there needs to be consensus"… "[to alter] the product range or [to decide] what is to be done with the product"*

Score: 5. Justification: There is clear accountability and control divided among team members.

Reporting of measures and their trends

When it comes to reporting measures and their trends, the team primarily shares their numbers within their team and with management, with the use of the aforementioned excel file. *"The KPI file is located centrally but not everyone [in other departments] has access to it. The information is generally not distributed"* "*We don't have anything set that we present to the rest of the organization"* For other employees, these numbers may at times be brought up at Friday meetings and conferences, without any clear regularity, similarly to the numbers of other departments. *"I think it's brought up [at conferences]. A lot of KPIs, budgets for the coming year, how things have been going".*

Score 5: Justification: The metrics are shared and discussed within the department, and team members have access to excel file with KPIs from other departments.

Frequency of performance reviews

Out of the four departments, the product team displays the highest level of connection between KPIs and overall direction of the team's work. The team consistently does performance reviews and seems to be the only team who clearly shows any significant effort being put into this area. *"Currently, we measure [inventory value] every other week"*. *"We share key measurements with [management] [every other week] ... including contribution margin." "[Regarding complaints] I follow up every month and come up with suggestions about [the product range]".*

Score: 5. Justification: Performance reviews are regular and consistent, and directly address metrics.

Interval control

The interval of control coincides mostly with the performance reviews. *"Currently, we measure [inventory value] every other week"*. Several metrics are calculated per order, such as delivery time and contribution margin, and then aggregated once a month for the excel document.

Score: 5. Justification: Consistent and regular control, where some measurements are aggregated to every month and at least one more often (inventory value).

4.1.5 Summary of technical control results

Levels of maturity in technical control across the different criteria in Smith and Bititci (2017):

Table 3 Overview of technical scoring per criterion and department

Criterion	Warehouse	Workshop	Sales	Product
Balanced set of metrics	2	4	4	5
High degree of awareness of the causal relationship	2	3	4	5
Strategic measures are deployed to lower levels	1	3	5	5
Targets and incentives link to strategic objectives	2	4	2	5
Managers with the right span of accountability and control	2	3	2	5

Measures and their trends are reported in an accessible manner	2	2	5	5
Regular and frequent performance reviews	1	1	1	5
Short interval control	N/A	3	3	5
Average	**1.7**	**2.9**	**3.3**	**5.0**

When it comes to use of performance measurement and technical control across the company investigated for this study, the findings suggest that the differences between departments are significant. Concerning overall levels of maturity, the warehouse is at the lower end of the spectrum, the product department scores the highest, and the workshop and sales departments both land somewhere in between, with average scores not too dissimilar to one another.

Balance of metrics

Employees across all departments, except for the warehouse, identify both non-financial and financial measures that are used within the department. Only in the case of the product team are the employees fully convinced of their implementation, which is what elevates their score.

Awareness of causal relationship

All departments show different scores, showing the full spectrum of understanding the connection between measures and outcome.

Strategic measures deployment to lower levels

For deployment of strategic measures to lower levels, we see that sales and product score the highest. They have several local measures each, making it easier for employees to connect the measures to day-to-day work. This is in contrast to the warehouse and workshop, whose measures are essentially the same as in the business plan.

Targets and incentives linking to strategic objectives

One thing that permeates the company is lack of incentives. Across all departments, only a handful of employees express that reaching targets set has any bearing on their day-to-day work. When it comes to the targets themselves, the workshop and the product department are the ones showing clear knowledge about the specific targets, and the product department are the only ones expressing that it actually affects their work.

Managers' accountability and control

One big factor affecting the scoring is that for the warehouse, workshop, and sales, the managers are new in their roles. This is contrasted to the product team, where responsibility is very clearly divided among team members.

Reporting of measures and their trends

For access to metrics, we can see that the product team and sales score the highest. They have clear access to measures and do not need to go about accessing them in a roundabout way, as opposed to most employees in the workshop and warehouse teams.

Frequency of performance reviews

There is clear lack of performance review practices in the company. The product team is the only team expressing any structured follow-ups and reviews on measures, while employees from other departments are in agreement that very little is done in their respective departments.

Interval control

For control intervals, most departments simply adhere to the monthly reporting in the central excel document, with inventory value being measured more often. While the inventory value is connected to the warehouse, in this case we saw it fit to attribute it to the product department instead, as the product department are the ones leading the measuring of inventory value and its measurements mostly affect their work rather than the warehouse's.

4.2 Social control - Performance Management

Here follows the matrix describing criteria of social control, showing the requirements needed to achieve the set level of maturity for each criterion. The four departments are assessed by applying this matrix to the data collected from the interviews and the survey.

Table 4. Overview of social control criterion

Criterion	**1**	**3**	**5**
Job enrichment and multiskilling / Specialization and demarcation of work	Work is repetitive, requiring no skill variation and focus on a single core competence.	Work involves some variety and the use of multiple skills.	Work includes a wide range of tasks, requiring continuous use of diverse skills and supporting broad expertise, and learning.
Autonomy and self-management with loose controls / Prescribed activities and tight controls	Work follows fixed schedules and predefined methods, with limited scope for independent planning, judgment, or initiative.	Work allows some influence over scheduling and execution, with room for judgment and initiative within established frameworks.	Work is highly independent, with significant control over planning, methods, and execution, and strong expectations for initiative and judgment.
Participation and industrial democracy	Decisions are mainly made by individuals or management, and team members have no influence.	Members have some influence (e.g. by giving feedback).	All members have real influence (e.g. by voting).
Psychological safety	Questioning authority feels unsafe, and mistakes are handled cautiously or avoided.	There is some safety in raising questions and issues, mainly in established forums or with certain individuals.	Everyone feels free to question decisions and discuss mistakes openly.
Appreciating differences and being open to new ideas	The team relies on established methods, is unreceptive to new ideas, and	The team is generally open to ideas and can identify improvement opportunities.	The team shows strong openness and curiosity, actively seeks and implements improvements.

	rarely identifies efficiency improvements.		
Creating time for idea sharing and reflection	Reflection is rare and mainly reactive. The focus is on urgent tasks, with little emphasis on learning or challenging existing assumptions.	The team reflects on its work at set times, often in planned meetings. Reflection is sometimes initiated, and assumptions are questioned occasionally but not consistently.	The team works systematically with reflection and improvement. Regular learning and challenging assumptions are clearly owned, encouraged, and integral to continuous development.
Internal competition	Strong individual performance comparisons create pressure and competition.	The team balances cooperation with some competition. Performance comparisons occur but are moderated by shared goals and collaborative efforts.	The team emphasizes collective goals over individual comparison. Internal competition is low.
Reward and Punishment	Performance evaluation is unclear and inconsistent. Recognition is narrowly tied to measurable results, and poor performance can have negative consequences without transparent criteria.	Performance evaluation follows a basic structure. Good performance is recognized, and poor performance is generally handled constructively. Assessment considers both results and other contributions, and expectations are mostly understood.	The team has a clear, transparent, and fair performance culture. Good performance is regularly recognized, poor performance is addressed developmentally, and evaluation considers results, behaviour, and collaboration, with shared understanding across the team.

4.2.1 Warehouse

Job enrichment and multiskilling / Specialization and demarcation of work / Job standardization

The team indicate a limited skill variation: *"Generally we are usually tidying up in the morning. Putting everything that should be on the shelves on the shelves, taking down stuff that should go to the workshop, be [...] or repaired in any other way. Then after breakfast we usually start with orders and check inbound goods, and do returns"*

Table 5. Survey results on Job enrichment and multiskilling / Specialization and demarcation of work / Job standardization in the warehouse department

Questions		Average	Standard Deviation	Min	Max	n
My job involves a great deal of task variety.	Q1	3,33	0,47	3	4	3
My job requires me to utilize a variety of different skills in order to complete the work	Q2	4,33	0,94	3	5	3
My tasks on the job are simple and uncomplicated.	Q19	4,33	0,94	3	5	3
My job is highly specialized in terms of purpose, tasks, or activities.	Q20	4,33	0,94	3	5	3

Score: 3. Justification: the tasks require multiple skills, but the work does not include a wide range of tasks. Furthermore, the survey results suggest that the perception from the employees is in line with this.

Autonomy and self-management with loose controls / Prescribed activities and tight control

The warehouse is characterized by some degree of self-management as illustrated by: *"what I like with this workplace is that is quite flexible and that there is trust "*. While the team follows a somewhat fixed schedule, the team is describing that they can replan tasks during the day: "*Yes, it's not like it's written down or anything, but it's like, you just call out to each other, and we solve it really well. It's just like, yes, I'll do this, okay, yes, but then I'll do a little bit there."*, and: *"We can decide from day to day how we want to spend the day. Then there are always exceptions that come up."*

Table 6. Survey results on Autonomy and self-management with loose controls / Prescribed activities and tight control in the warehouse department.

Questions		Average	Standard Deviation	Min	Max	n
The job allows me to make my own decisions about how to schedule my work.	Q3	4,33	1,70	2	6	3
The job gives me a chance to use my personal initiative or judgment in carrying out the work.	Q4	4,67	1,25	3	6	3
The job allows me to make decisions about what methods I use to complete my work.	Q5	4,33	0,94	3	5	3
I sometimes feel constricted in the way I am able to work with my tasks.	Q21	2,33	1,25	1	4	3

Score: 3 Justification: the team says that they can plan the day independently, and thus have some control over planning and execution. The survey indicates that they have some influence over scheduling, even if they do not all agree.

Participation and industrial democracy

The team describes that they can discuss ideas with their direct manager and other stakeholders: *"We usually decide on this together down in the warehouse first. That we want to change this and this and this. Then we bring it up with the respective person who needs to be consulted. Most often, it's [our direct manager] now.*" If they feel that the suggestion only affects them, they are discussing it and taking decisions within their team: "*Yes, at the morning meetings I have with the [direct manager]. And if it's something bigger, we talk to him, but if it's something smaller, we decide it ourselves".*

Table 7. Survey results on Participation and industrial democracy in the warehouse department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, we spend time discussing our team's plan, purpose, goals, and expectations for our project.	Q6	3,67	1,25	2	5	3
As a member of this team, I have a real say in how this team carries out its work.	Q7	4,00	1,41	2	5	3
My team supports everyone actively participating in decision making.	Q8	5,33	0,94	4	6	3

Score: 3. Justification: the team has influence through feedback and by voicing their opinion, but no data supports that e.g. voting or similar stronger ways of influence. While the survey suggests that they are not in agreement, the average indicates that they only have limited influence.

Psychological safety

The team shows that the psychological safety is high: *"I am open to [talk about mistakes, challenges and things that can lead to conflict]. I have no problems with it. If there is something I want to change or something I want to bring up then I do that. That has never been a problem"*.

Table 8. Survey results on Psychological safety in the warehouse department.

Questions		Average	Standard Deviation	Min	Max	n
The members of my team recognize each other's accomplishments and hard work.	Q9	5,67	0,47	5	6	3
I feel free to question the decisions or action of those with more authority.	Q10	5,33	0,47	5	6	3
I feel free to bring up mistakes, problems and tough issues.	Q11	6,33	0,47	6	7	3
It is difficult to ask other members of this organization for help.	Q12	1,67	0,94	1	3	3

Score: 4. Justification: the team says that they can talk about mistakes and challenge authority on proposed changes. The survey results show that they feel safe talking about mistakes, but less safe when questioning authority. A 5 in the survey indicate "agree to some degree".

Appreciating differences and being open to new ideas

The team is mentioning that they are talking about ideas of improvement and knows how to make suggestions: "*We usually decide on this together down in the warehouse first. That we want to change this and this and this. Then we bring it up with the respective person who needs to be consulted. Most often, it's [our direct manager] now.*"

Table 9. Survey results on Appreciating differences and being open to new ideas in the warehouse department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, we are always open to listening to our co-workers' new ideas.	Q13	6,00	0,82	5	7	3
In my team, we are attentive to new opportunities that can make our system more efficient and effective.	Q14	6,00	0,82	5	7	3
The members of my team know how to accept people who are different.	Q15	4,67	2,62	1	7	3

Score: 3. Justification: while the team is open to new ideas and identify improvement opportunities, there is no data to support that they are actively seeking and implementing improvements. The survey support this.

Creating time for idea sharing and reflection

There is no explicit structure or time for idea sharing and reflection, but the team explain that they are able to discuss issues and improvements with the direct manager during the set meetings and during the workday: "We *usually bring it up with [our direct manager] in those cases. As I said, two, three times a week. We discuss with him what we think about things. And we have the possibility to change it"*

Table 10. Survey results on Creating time for idea sharing and reflection the warehouse department.

Questions		Average	Standard Deviation	Min	Max	n
We regularly take time to figure out ways to improve our organization's work processes.	Q16	3,33	0,94	2	4	3
In this organization, someone always makes sure that we stop to reflect on the organization's work process.	Q17	4,00	0,00	4	4	3
People in this team are encouraged to speak up to test assumptions about issues under discussion.	Q18	4,50	0,50	4	5	2

Score: 3. Justification: while the team lacks explicit structures for reflection, they do have meetings planned where this is possible. The survey seems to imply that they do not work consistently with reflection and improvement.

Internal competition

The team does not report any internal competition, when asked: *"I don't think that's apparent. Not what we've noticed, anyway. I think it's good".* And they do describe a good team work towards common goals as previously mentioned: *"Yes, it's not like it's written down or anything, but it's like you just call out to each other, and we solve it really well. It's just like, yes, I'll do this, okay, yes, but then I'll do a little bit there."*

Table 11. Survey results on Internal competition in the warehouse department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, members are often compared to one another based on their performance.	Q22	1,33	0,47	1	2	3
I feel pressured to outperform my coworkers.	Q23	1,33	0,47	1	2	3
In my team, I often feel like I compete with my colleagues for recognition or opportunities.	Q24	1,00	0,00	1	1	3

Score: 5. Justification: the team is working together to solve common tasks. The survey supports that there is no internal competition in the team.

Reward and Punishment

The warehouse team do not feel like they are affected if targets are not reached, when asked*: "Not that I have noticed at least. So it is not like I am affected".* But they can receive feedback if there has been an error: *"yes, I believe we do [receive feedback] if it is needed. But it doesn't happen that often."*

Table 12. Survey results on Reward and Punishment in the warehouse department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, good performance is clearly recognized by management.	Q25	4,67	0,47	4	5	3
In my team, poor performance often leads to negative consequences.	Q26	1,67	0,94	1	3	3
Rewards and/or recognition in my team is strongly linked to achieving measurable results.	Q27	3,00	1,41	1	4	3
I understand the way in which my performance is evaluated by management.	Q28	4,50	0,50	4	5	2

Score: 2. Justification: While poor performance does not lead to negative consequences, the survey and interview suggests that the performance evaluation is unclear and inconsistent.

4.2.2 Workshop

Job enrichment and multiskilling / Specialization and demarcation of work / Job standardization

The team is regularly going through upskilling workshops: *"And then we go through it together with all the mechanics and check it. He goes through it really carefully, point by point. [..]. So that's really where we go through it, with the help of the training and reviews together with him [...]"*. Some of the tasks are routine based, but the team sometimes completes tasks that requires problem solving: *"I've sometimes gotten stuff that no one else here has done. Okay. So they just, yeah, but it'll work out for sure. You have to try a few things out. But then there are more standard products, there's more of those. This is the approach."*

Table 13. Survey results on Job enrichment and multiskilling / Specialization and demarcation of work / Job standardization in the workshop department.

Questions		Average	Standard Deviation	Min	Max	n
My job involves a great deal of task variety.	Q1	3,33	0,47	4	5	4
My job requires me to utilize a variety of different skills in order to complete the work.	Q2	4,33	0,94	5	7	4
My tasks on the job are simple and uncomplicated	Q19	4,33	0,94	5	6	3

My job is highly specialized in terms of purpose, tasks, or activities.	Q20	4,33	0,94	1	7	4

Score: 3. Justification: while the team works on similar products each time, every product comes with its set of problems requiring continuous learning, and broad expertise. The survey suggests rather that there is just some variety of skills and tasks, and that it is partly specialized.

Autonomy and self-management with loose controls / Prescribed activities and tight controls

They are assigned tasks each day to complete, but they are also able to reschedule if there are concrete problems that hinder them from completing their task: *"today I had two tasks scheduled for me, and then I knew that for one of them we are awaiting parts, so I took the other one first. I just tell [direct manager] then that I will take this one instead".* The team says that this system is quite new: *"It has started to become a little more strict. Before, it was more like you went in and checked what was available, and then you took what you wanted to do. But now it's a little more like they schedule you [...] It's so new to me. It's since last week."*

Table 14. Survey results on Autonomy and self-management with loose controls / Prescribed activities and tight controls in the workshop department.

Questions		Average	Standard Deviation	Min	Max	n
The job allows me to make my own decisions about how to schedule my work.	Q3	4,50	0,50	4	5	4
The job gives me a chance to use my personal initiative or judgment in carrying out the work.	Q4	5,75	0,83	5	7	4
The job allows me to make decisions about what methods I use to complete my work.	Q5	5,67	0,47	5	6	3
I sometimes feel constricted in the way I am able to work with my tasks.	Q21	4,25	2,38	1	7	4

Score: 3. Justification: the team has some influence over scheduling but are not working highly independently since they are assigned tasks. The survey suggests that the employees can use their own judgment and choice of methods, but do not have significant control over planning.

Participation and industrial democracy

While there is no explicit time for coming up with suggestions of improvements, the workshop team can bring up ideas regularly: *"During the morning meeting, I would say we can bring it up "*, and they generally feel that they are listened to: *"We discuss everything that concerns the workshop. It's mostly we who are in [the workshop] who decide how things should be. Or come up with ideas about how things should be. In many cases, that's how it turns out."*

Table 15. Survey results on Participation and industrial democracy in the workshop department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, we spend time discussing our team's plan, purpose, goals, and expectations for our project.	Q6	4,75	1,48	3	7	4
As a member of this team, I have a real say in how this team carries out its work.	Q7	4,50	0,87	3	5	4
My team supports everyone actively participating in decision making.	Q8	4,25	1,48	2	6	4

Score: 3. Justification: the team has influence through feedback and by voicing their opinion, but no data supports e.g. voting or similar stronger ways of influence. The survey shows that they are in disagreement, but it also shows that they feel like they can influence decisions to some degree.

Psychological safety

The workshop team says that they are feeling free to bring up tough issues: *"I don't feel that there's anything strange about it at all. If something goes wrong, it goes wrong. Then you just have to make the best of it and solve the problem", and: "I feel safe at least [...]. It is better to just bring it up so that it can get solved. Rather than letting it stay a problem."*

Table 16. Survey results on Psychological safety in the workshop department.

Questions		Average	Standard Deviation	Min	Max	n
The members of my team recognize each other's accomplishments and hard work.	Q9	4,25	1,09	3	6	4
I feel free to question the decisions or action of those with more authority.	Q10	3,25	1,79	1	6	4
I feel free to bring up mistakes, problems and tough issues.	Q11	6,00	0,71	5	7	4
It is difficult to ask other members of this organization for help.	Q12	2,00	1,22	1	4	4

Score: 3. Justification: the team says that they feel free to admit mistakes and to talk about problems. In the survey the team says that they are not feeling fully safe questioning authority.

Appreciating differences and being open to new ideas

They in general feel listened to when suggestions are made by them, but there is no explicit structure on how to make them. The team describes that they can bring up new ideas at team meetings or directly with their manager if it is affecting the workshop: *"Actually, just go and talk to [direct manager]. It depends a little on what area it's in. But if it's something to do with the workshop and stuff like that, we'll just go and talk to [direct manager], or we'll bring it up at the morning meeting."*

Table 17. Survey results on Appreciating differences and being open to new ideas in the workshop department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, we are always open to listening to our co-workers' new ideas.	Q13	6,00	0,00	6	6	4
In my team, we are attentive to new opportunities that can make our system more efficient and effective.	Q14	4,75	0,43	4	5	4
The members of my team know how to accept people who are different	Q15	5,00	1,00	4	6	4

Score: 3. Justification: the team is open to ideas and seems to be able to identify improvement opportunities, but there is no data to support that they are actively seeking improvements.

Creating time for idea sharing and reflection

The workshop team does not have explicit time for idea sharing and reflection, but all are clear that ideas can be brought up with the manager and at team meetings*: "Actually, just go and talk to [direct manager]. It depends a little on what area it's in. But if it's something to do with the workshop and stuff like that, we'll just go and talk to [direct manager], or we'll bring it up at the morning meeting."*

Table 18. Survey results on Creating time for idea sharing and reflection in the workshop department.

Questions		Average	Standard Deviation	Min	Max	n
We regularly take time to figure out ways to improve our organization's work processes	Q16	4,33	1,70	2	6	3
In this organization, someone always makes sure that we stop to reflect on the organization's work process.	Q17	5,00	0,00	5	5	2
People in this team are encouraged to speak up to test assumptions about issues under discussion.	Q18	3,67	1,25	2	5	3

Score: 3. Justification: There is no data to support that there is any planned time for reflection. The team agrees that they to some degree stop to reflect on the organization's work process, and while they do not agree it does not seem like they schedule time for finding improvements.

Internal competition

The team is clear that there is no internal competition. In line with the survey results, the team explains that there is a helpful culture where the members help each other: *"[...] we work together more than anything".*

Table 19. Survey results on Internal competition in the workshop department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, members are often compared to one another based on their performance.	Q22	1,25	0,43	1	2	4

I feel pressured to outperform my coworkers.	Q23	1,25	0,43	1	2	4
In my team, I often feel like I compete with my colleagues for recognition or opportunities.	Q24	1,50	0,50	1	2	4

Score: 5. Justification: The team emphasizes teamwork. The survey shows that there is little or no competition.

Reward and Punishment

There is no clear reward or punishment structure, and the team does feel that they get neither punished nor rewarded. Some members feel that there is insufficient feedback on the work. When there has been an issue with a product the team is collectively educated to avoid that error: *"Because he goes through our high-turnover products and looks at all the mistakes we've made. And then we go through it together with all the mechanics and check it"*, but no individual knows who originally did the error: *"I think there is lack of [feedback], actually. I would say so. You don't even find out if it's your own product that's broken. You don't find out anything."*

Table 20. Survey results on Reward and Punishment in the workshop department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, good performance is clearly recognized by management.	Q25	3,50	0,50	3	4	4
In my team, poor performance often leads to negative consequences.	Q26	2,25	1,09	1	4	4
Rewards and/or recognition in my team is strongly linked to achieving measurable results.	Q27	2,00	0,00	2	2	2
I understand the way in which my performance is evaluated by management.	Q28	2,00	1,22	1	4	4

Score: 2. Justification: the team says in the interview that they get no individual feedback, and the survey suggests that they do not understand how performance is evaluated, although they are not in agreement.

4.2.3 Sales

Job enrichment and multiskilling / Specialization and demarcation of work / Job standardization

The sales team describes that they are bound by phone calls during the peak season but during low seasons they are able to do other tasks: *"So then [during peak season] there's more focus on us sitting and being available at the phone and taking calls that come in. [...] So you don't have much flexibility [...] And then for the rest of the year, at least for me, I have more time for outside sales and a few other projects".*

Table 21. Survey results on Job enrichment and multiskilling / Specialization and demarcation of work / Job standardization in the sales department.

Questions		Average	Standard Deviation	Min	Max	n
My job involves a great deal of task variety.	Q1	5,60	0,80	5	7	5
My job requires me to utilize a variety of different skills in order to complete the work.	Q2	6,20	0,75	5	7	5
My tasks on the job are simple and uncomplicated.	Q19	3,20	1,60	1	6	5
My job is highly specialized in terms of purpose, tasks, or activities.	Q20	3,20	1,33	1	5	5

Score: 4. Justification: the work involves some task variety and the survey suggests that multiple skills are needed. But the data does not support that a broad range of expertise and learning is needed to fulfill the tasks.

Autonomy and self-management with loose controls / Prescribed activities and tight controls

The sales team is heterogenous, where one part has more autonomy than the other. The outdoor sales reps have a greater degree of freedom than the indoor sales reps, as described: "*It's more flexible for an outside salesperson than it is for an inside salesperson. I would say so. You have to make decisions there and then. You're out with the customer yourself, so you can't bring up the issue at the customer's place, so to speak. The customer expects an answer right away".* For the indoor sales rep team the task is more routine based: *"Yes it [my work] is maybe 70% routine, 30% problem solving. Then you get to be a bit creative and think a bit".*

Table 22. Survey results on Autonomy and self-management with loose controls / Prescribed activities and tight controls in the sales department.

Questions		Average	Standard Deviation	Min	Max	n
The job allows me to make my own decisions about how to schedule my work.	Q3	5,20	0,75	4	6	5
The job gives me a chance to use my personal initiative or judgment in carrying out the work.	Q4	5,40	0,49	5	6	5
The job allows me to make decisions about what methods I use to complete my work.	Q5	5,40	0,49	5	6	5
I sometimes feel constricted in the way I am able to work with my tasks.	Q21	3,20	1,47	1	5	5

Score: 3. Justification: based on the interview data, the indoor sales reps do have some, but not significant, influence on their planning, methods and execution. While the outdoor reps have greater influence, with expectations on initiative and judgement. The survey seems to show that there is some influence over scheduling and methods and that some own judgement is needed.

Participation and industrial democracy

The team is able to discuss the ideas in their weekly meetings as well as in internal communication systems: *"It can come up in team chats, it can come up in meetings when you're talking and stuff like that [...] there is no formal system for sending in ideas"*. During the meetings the team feels that they can make decisions collectively on routines, schedule and how to communicate with the customer: *"[we decide about] routines for placing orders, how to write, how to label all different cases to enable search and traceability. More or less everything".*

Table 23. Survey results on Participation and industrial democracy in the sales department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, we spend time discussing our team's plan, purpose, goals, and expectations for our project.	Q6	5,60	0,49	5	6	5
As a member of this team, I have a real say in how this team carries out its work.	Q7	5,00	1,10	3	6	5
My team supports everyone actively participating in decision making.	Q8	5,00	0,63	4	6	5

Score: 4. Justification: the team have real influence beyond just voicing opinion, by changing routines and way of working together, and the survey suggests that they at least perceive some level of influence, but not all feel that they have a high level of influence.

Psychological safety

The team does feel safe, *"No, but relatively secure, nonetheless. [...] There is a kind of culture of solving problems or similar issues together. So no, I don't really see it as strange [to talk about mistakes]".* In general, the team feels that they are able to discuss tough issues, without problem: *"We are quite close to each other and we know that there is a high level of tolerance for both jokes and respect towards each other. [...] There is still a good sense of community among everyone who works here."*

Table 24. Survey results on Psychological safety in the sales department.

Questions		Average	Standard Deviation	Min	Max	n
The members of my team recognize each other's accomplishments and hard work.	Q9	5,20	0,40	5	6	5
I feel free to question the decisions or action of those with more authority.	Q10	5,80	1,17	4	7	5
I feel free to bring up mistakes, problems and tough issues.	Q11	6,20	0,75	5	7	5
It is difficult to ask other members of this organization for help.	Q12	3,00	1,79	1	5	5

Score: 4. Justification: the interview suggests the team feels safe to discuss mistakes, and question authority. The survey suggests that most feel safe to discuss mistakes and question decisions, but not all.

Appreciating differences and being open to new ideas

The team describes that the group is open to suggestions: "*I feel that, generally speaking, we are all be able to contribute ideas and suggestions. There is always room for discussion. And for my part, I also feel that there is definitely room for that. Then again, perhaps not everything will be registered, but there is always room for ideas to be considered and discussed again or something similar. You get your voice heard."* They also describe that suggestions come frequently: *"Every week, I would say that something comes up. If it's a simple click solution in a program, then you just send a message in Teams. Then you don't need to involve anyone else. If it's something bigger, it's brought up at a sales meeting and then taken up by the management team."*

Table 25. Survey results on Appreciating differences and being open to new ideas in the sales department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, we are always open to listening to our co-workers' new ideas.	Q13	5,20	0,75	4	6	5
In my team, we are attentive to new opportunities that can make our system more efficient and effective.	Q14	6,20	0,75	5	7	5
The members of my team know how to accept people who are different.	Q15	5,40	1,62	3	7	5

Score: 5. Justification: the interview data shows that the team is open to new ideas and can identify improvement opportunities. Because of the frequency that new ideas are brought up and implemented, it can be seen as continuous. The survey data seems to support this.

Creating time for idea sharing and reflection

The team does not have an explicit structure for idea sharing and reflection, but they are aware about how to bring up suggestions: *"It depends. It might come up in team chats, it might come up in meetings when people are talking and so on. And most of the time, it's just talked about and doesn't lead to any particular action. There is no formal system for submitting ideas."*

Table 26. Survey results on Creating time for idea sharing and reflection in the sales department.

Questions		Average	Standard Deviation	Min	Max	n
We regularly take time to figure out ways to improve our organization's work processes.	Q16	5,80	0,98	4	7	5
In this organization, someone always makes sure that we stop to reflect on the organization's work process.	Q17	4,60	1,02	3	6	5
People in this team are encouraged to speak up to test assumptions about issues under discussion.	Q18	4,75	0,83	4	6	4

Score: 3. Justification: there are no explicit structures for reflection, but suggestions for improvements are brought up in meetings and other forums. The survey shows that they are not in complete agreement, but most say that they regularly take time to improve the organization's work processes. It also shows that they only to some degree feel encouraged to test assumptions.

Internal competition

There is no actual competition among the members of the team: "*We have a different type of sales compared to insurance salespeople or subscription salespeople. We have customers or workshops who contact us and want to buy, and then someone takes care of it. I mean, we have a mailing inbox together where we pick up cases, and we have to pick them up in a certain order.*" But it is possible to look at a leaderboard: "*Yes, we measure things that I sometimes check, for example, this switchboard service has a statistics tab where you can see how many calls come in, how long the calls are, and there is also a kind of leaderboard where you can see who takes the most calls*". The team is clear that they see their task as a team-task, and that there is no benefit to compete: *"It is more of a shared inbox that we all are handling together".*

Table 27. Survey results on Internal competition in the sales department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, members are often compared to one another based on their performance.	Q22	3,80	1,17	2	5	5
I feel pressured to outperform my coworkers.	Q23	4,80	2,40	1	7	5
In my team, I often feel like I compete with my colleagues for recognition or opportunities.	Q24	2,00	1,55	1	5	5

Score: 3. Justification: in the interviews the team do emphasize collective goals over individual comparisons, but suggest some degree of competition. Furthermore, there is survey data to support some competition, but the team is not in agreement.

Reward and Punishment

There are no rewards within the team: *"[...] there is no pressure to sell, we don't get any bonuses, we don't get any kickbacks or anything else for selling more or taking on more cases."*. There might be some feedback from colleagues and managers if routines are not followed: *"Yes, it's the manager who has to take charge and give feedback and so on. But we also keep each other in check quite a bit and tell each other when we see that someone isn't doing what they're supposed to do. It's the manager and the team internally."*

Table 28. Survey results on Reward and Punishment in the sales department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, good performance is clearly recognized by management.	Q25	3,40	1,62	1	5	5

In my team, poor performance often leads to negative consequences.	Q26	4,60	1,50	2	6	5
Rewards and/or recognition in my team is strongly linked to achieving measurable results.	Q27	4,80	1,17	4	7	5
I understand the way in which my performance is evaluated by management.	Q28	5,20	0,98	4	7	5

Score: 2. Justification: the interviews suggest that there is no incentive to perform better, and while not agreeing in the survey, the data seems to suggest that good performance is usually not recognized, nor that poor performance leads to negative consequences. Performance evaluation seems to be understood to some degree.

4.2.4 Product

Job enrichment and multiskilling / Specialization and demarcation of work / Job standardization

The team reports that their tasks are much more problem solving-oriented than routine-based: *"Right now my role is probably 90% problem solving, and about 10% routine".* Furthermore, they say that a certain level of specific knowledge is necessary to complete their work: *"Yes, but it's actually necessary [with technical knowledge] in order to plan what you're going to buy, and even when you're looking to buy [unfinished products], you don't want to buy anything completely unnecessary"*

Table 29. Survey results on Job enrichment and multiskilling / Specialization and demarcation of work / Job standardization in the product department.

Questions		**Average**	**Standard Deviation**	**Min**	**Max**	**n**
My job involves a great deal of task variety.	Q1	6,33	0,94	5	7	3
My job requires me to utilize a variety of different skills in order to complete the work.	Q2	6,67	0,47	6	7	3
My tasks on the job are simple and uncomplicated.	Q19	1,33	0,47	1	2	3
My job is highly specialized in terms of purpose, tasks, or activities.	Q20	2,33	1,89	1	5	3

Score: 5. Justification: the team describes that there is a lot of problem-solving, and that a diverse set of skills are needed to complete their tasks. The survey supports that there is high task variety, and requirement of several different skills.

Autonomy and self-management with loose controls / Prescribed activities and tight controls

Their work tasks can be scheduled after their own decisions: *"Yes, I have reports to write. So, I write reports. I check in with the workshop manager. I usually check in with him at 3 o'clock. [...] Then I report tomorrow's sales after that. [...] Then for* *the rest of the day, I can do as I see fit*“. There are some set routines and meetings: *“[the meetings] are every Tuesday and Wednesday”.*

Table 30. Survey results on Autonomy and self-management with loose controls / Prescribed activities and tight controls in the product department.

Questions		Average	Standard Deviation	Min	Max	n
The job allows me to make my own decisions about how to schedule my work.	Q3	5,67	0,47	5	6	3
The job gives me a chance to use my personal initiative or judgment in carrying out the work.	Q4	6,00	0,00	6	6	3
The job allows me to make decisions about what methods I use to complete my work.	Q5	5,67	0,47	5	6	3
I sometimes feel constricted in the way I am able to work with my tasks.	Q21	4,00	2,16	2	7	3

Score: 5. Justification: the team describes in the interviews that they can individually plan their work and execution of tasks with respect to some meetings. The survey seems to support this.

Participation and industrial democracy

Moving on, the team reports that they take a lot of common decisions within the team regarding the products: *“Everything from which products we should make and which we should not make. Everything related to the products. To pricing and which suppliers we use”.* The team only takes decisions on matter when all the members agree: *“for a decision to go through [in the product team], there needs to be a consensus“*. The decisions can made done in meetings: *“We usually bring it up, depending on where it is. We have product meetings and we have a product group, and then we also have for purchasing. Depending on where it is, we bring it up there. If it's a good idea, we discuss it and if we decide it's right, we go ahead with it.”*

Table 31. Survey results on Participation and industrial democracy in the product department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, we spend time discussing our team’s plan, purpose, goals, and expectations for our project.	Q6	5,67	1,89	3	7	3
As a member of this team, I have a real say in how this team carries out its work.	Q7	5,67	0,47	5	6	3
My team supports everyone actively participating in decision making.	Q8	5,67	0,94	5	7	3

Score: 5. Justification: the team describes that everyone must be involved, and a vote needs to be done to decide. The survey supports the idea that they feel that they have real influence.

Psychological safety

The employees report that they feel safe to talk about issues, improvements, as well as mistakes: "*It is definitely not a climate where it is dangerous to say that you have made a mistake or that someone else has made a mistake*." Furthermore they say that the climate at the company and within the team is good: "*I would say that that is something that has been really great [here] during all years. I mean, how we all treat each other. We've always had a blast*", and that there is a culture of helping each other: "*We understand that things will go wrong at some point. And when it does, we also have to say, 'What happened? And where did the mistake occur?' It doesn't really matter where it occurred. It's more about how we do this so that it doesn't go wrong again. And that can be really tricky, because it is, but I still think that the atmosphere in the group is quite open to that kind of thing, actually.*"

Table 32. Survey results on Psychological safety in the product department.

Questions		Average	Standard Deviation	Min	Max	n
The members of my team recognize each other's accomplishments and hard work.	Q9	5,00	0,82	4	6	3
I feel free to question the decisions or action of those with more authority.	Q10	6,33	0,47	6	7	3
I feel free to bring up mistakes, problems and tough issues.	Q11	6,67	0,47	6	7	3
It is difficult to ask other members of this organization for help.	Q12	2,67	0,47	2	3	3

Score: 5. Justification: the team describes in the interviews that they feel free to discuss mistakes, and in the survey they say that they feel free to both discuss mistakes and to question authority.

Appreciating differences and being open to new ideas

The team do make decisions when the idea is seen as good: *"We usually bring it up, depending on where it is. We have product meetings and we have a product group, and then we also have purchasing. Depending on where it is, we bring it up there. If it's a good idea, we discuss it and if we decide it's right, we go ahead with it".* The team describes that they are constantly looking for improvements: *"Often directly linked to ongoing work. We do not have formalized innovation meetings, but we have a strong culture of continuously discussing improvements."*

Table 33. Survey results on Appreciating differences and being open to new ideas in the product department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, we are always open to listening to our co-workers' new ideas.	Q13	6,00	0,00	6	6	3
In my team, we are attentive to new opportunities that can make our system more efficient and effective.	Q14	6,00	0,82	5	7	3
The members of my team know how to accept people who are different	Q15	5,33	0,94	4	6	3

Score 5: Justification: in the interview the employees say that they actively seek and implement improvements. This is also supported in the survey.

Creating time for idea sharing and reflection

The team has no formal structures for idea sharing and reflection, instead it is *"Often directly linked to ongoing work. We do not have formalized innovation meetings, but we have a strong culture of continuously discussing improvements."*

Table 34. Survey results on Creating time for idea sharing and reflection in the product department.

Questions		Average	Standard Deviation	Min	Max	n
We regularly take time to figure out ways to improve our organization's work processes.	Q16	5,33	2,36	2	7	3
In this organization, someone always makes sure that we stop to reflect on the organization's work process.	Q17	4,00	1,41	2	5	3
People in this team are encouraged to speak up to test assumptions about issues under discussion.	Q18	6,00	1,41	4	7	3

Score 3: Justification: while the team are looking for improvements, the survey and interview data suggest that it is not done systematically.

Internal competition

The team reports no internal competition. The members of the team have different roles but are working as a team: *"We work toward the same goals but with different perspectives ".*

Table 35. Survey results on Internal competition in the product department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, members are often compared to one another based on their performance.	Q22	2,00	1,41	1	4	3
I feel pressured to outperform my coworkers.	Q23	4,00	2,16	1	6	3
In my team, I often feel like I compete with my colleagues for recognition or opportunities.	Q24	3,67	2,05	1	6	3

Score 5: Justification: the team are working toward collective goals. The survey data suggests little to no competition.

Reward and Punishment

There are no rewards or punishments. The team states that they are giving each other feedback if someone makes a mistake*: "we don't really have that problem. And we can still tell ourselves. I was told off last Monday because I planned completely wrong. I was supposed to be at one meeting and ended up at a* *completely different one. And it wasn't a big deal. But that is probably because we have an [accepting atmosphere].”*

Table 36. Survey results on Reward and Punishment in the product department.

Questions		Average	Standard Deviation	Min	Max	n
In my team, good performance is clearly recognized by management.	Q25	2,33	1,25	1	4	3
In my team, poor performance often leads to negative consequences.	Q26	2,00	0,82	1	3	3
Rewards and/or recognition in my team is strongly linked to achieving measurable results.	Q27	2,33	1,25	1	4	3
I understand the way in which my performance is evaluated by management.	Q28	4,33	0,47	4	5	3

Score: 2. Justification: while the interview data suggests that they give each other feedback, the survey suggest that good performance is not recognized and poor performance does not lead to negative consequences. Furthermore, the survey suggests that the way performance evaluation is done is not completely understood.

4.2.5 Summary of social control results

Using the maturity matrix in 4.2.1 (Table 4) on the results in the previous subchapters, the following table was established.

Table 37. Overview of social scoring per criterion and department.

Criterion	Warehouse	Workshop	Sales	Product
Job enrichment and multiskilling / Specialization and demarcation of work / Job standardization	3	3	4	5
Autonomy and self-management with loose controls / Prescribed activities and tight controls	3	3	3	5
Participation and industrial democracy	3	3	4	5
Psychological safety	4	3	4	5
Appreciating differences and being open to new ideas	3	3	5	5
Creating time for idea sharing and reflection	3	3	3	3

Internal competition	5	5	3	5
Reward and Punishment	2	2	2	2
Average	**3,3**	**3,1**	**3,5**	**4,4**

Job enrichment and multiskilling
The differences in *Job enrichment and multiskilling* are primarily due to the differences in range of tasks these departments have.

Autonomy and self-management with loose controls
All except the product group score the same. The difference here is attributed to the greater extent that the product group can schedule their work.

Participation and industrial democracy
The workshop and the warehouse group have influence through feedback, the sales group has slightly higher influence since they can change routines together, and the product group has the highest influence since they vote on each decision.

Psychological safety
The groups all feel safe to talk openly about mistakes, but less so to challenge authority. Product is the only group where the data signals that they feel safe to do both.

Appreciating differences and being open to new ideas
While all departments to some extent work with identifying improvement opportunities, product and sales shows a higher actively seeking and implementing improvements, and thus scored higher.

Creating time for idea sharing and reflection
All the departments score the same, since there is a lack of *systematic* work with improvement and reflection.

Internal Competition
The sales team was the only department to not score the highest, as there are signs of some internal competition in the sales group.

Reward and Punishment
There is no sign that this is worked with systematically in any group and therefore each group gets the same score.

4.3 Employee Engagement

In the survey there were also questions related to employee engagement. The results from this part of the survey are presented in this section.

4.3.1 Warehouse

Below are the aggregated answers from the warehouse on the questions related to employee engagement.

Table 38. Survey results on Employee Engagement in the warehouse department.

Questions		Average	Standard Deviation	Min	Max	n
Sometimes I am so into my job that I lose track of time.	Q29	4,00	1,63	2	6	3
My mind often wanders and I think of other things when doing my job (R).	Q30	4,00	1,41	3	6	3
I am highly engaged in this job.	Q31	4,00	1,41	3	6	3
Being a member of this organization is very captivating	Q32	4,00	1,41	3	6	3
I am highly engaged in this organization.	Q33	3,00	1,41	2	5	3

4.3.2 Workshop

Below are the aggregated answers from the workshop on the questions related to employee engagement.

Table 39. Survey results on Employee Engagement in the workshop department.

Questions		Average	Standard Deviation	Min	Max	n
Sometimes I am so into my job that I lose track of time.	Q29	4,00	2,12	2	7	4
My mind often wanders and I think of other things when doing my job (R).	Q30	2,25	1,09	1	4	4
I am highly engaged in this job.	Q31	4,75	1,79	2	7	4
Being a member of this organization is very captivating	Q32	4,25	1,92	2	7	4
I am highly engaged in this organization.	Q33	4,75	1,30	3	6	4

4.3.3 Sales

Below are the aggregated answers from sales on the questions related to employee engagement.

Table 40. Survey results on Employee Engagement in the sales department.

Questions		Average	Standard Deviation	Min	Max	n
Sometimes I am so into my job that I lose track of time.	Q29	4,80	2,40	1	7	5
My mind often wanders and I think of other things when doing my job (R).	Q30	2,80	1,33	1	5	5
I am highly engaged in this job.	Q31	6,20	0,40	6	7	5

Being a member of this organization is very captivating	Q32	5,60	1,02	4	7	5
I am highly engaged in this organization.	Q33	6,40	0,49	6	7	5

4.3.4 Product

Below are the aggregated answers from product on the questions related to employee engagement.

Table 41. Survey results on Employee Engagement in the product department.

Questions		Average	Standard Deviation	Min	Max	n
Sometimes I am so into my job that I lose track of time.	Q29	5,00	0,82	4	6	3
My mind often wanders and I think of other things when doing my job (R).	Q30	1,33	0,47	1	2	3
I am highly engaged in this job.	Q31	5,67	1,25	4	7	3
Being a member of this organization is very captivating	Q32	4,67	2,05	2	7	3
I am highly engaged in this organization.	Q33	5,67	1,25	4	7	3

4.3.5 Employee Engagement Score

Below the employee engagement scores for each department are listed.

Table 42. Overview of employee engagement per department.

Department	Average	Standard Deviation	Min	Max	n
Warehouse	3,8	0,99	3	5,2	3
Workshop	5,0	1,07	3,2	5,8	4
Sales	5,7	0,71	4,4	6	5
Product	5,8	0,90	3,4	5,6	3

The standard deviation, minimum and maximum values are calculated based on the individual employees' employee engagement.

4.4 Combined results

Figure 2 visualizes the results of technical and social control as well as employee engagement. The scoring in social control score is represented by the x-axis, the technical control score by the y-axis, and the size of the bubble the extent of employee engagement. Product has the highest maturity in both social and technical control. The other departments score similarly with regards to social control as each other, but warehouse scores significantly lower on technical control. Sales and product score the highest on employee engagement, followed by workshop and warehouse.

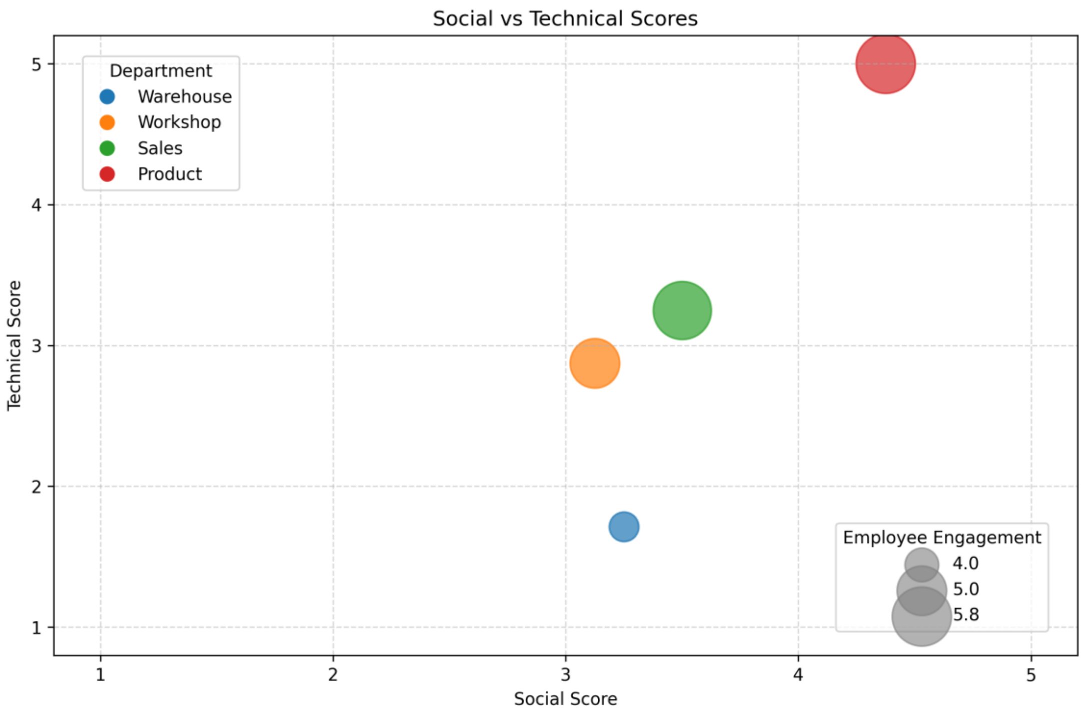

Figure 2. Bubble graph of technical and social control, and employee engagement per department.

5. Discussion

In this chapter, we discuss the differences between departments and attempt to connect them to our theoretical framework. While investigating the specific reasons behind the disparities in maturity levels across the departments is outside the scope of the study, we nevertheless hope that our discussion aids management in understanding these differences, as to facilitate the efforts in using the findings.

5.1 Technical control

The results indicate that the department with the highest level of maturity in technical control is the product department, followed by sales and workshop, who score similarly, and finally the warehouse, who score significantly lower than workshop and sales. For technical control, product scores 5 across all criteria, showing that they are at the top end of the spectrum of company practices when it comes to the implementation of performance measurement. To reiterate, the requirements are empirically constructed based on the data in the company. This means that although the product department shows the highest maturity at the company, this assessment alone is not enough to say how it performs compared to similar departments in other organizations (this, by definition, is true for all departments).

Overall, one factor that is likely to greatly affect the relative maturities displayed within the departments is the product team's experience within the company; the employees within the product team have in multiple cases had various roles within the company previously and is the team with the greatest average years spent at the company. This likely has a bearing on the scoring in the majority of criteria within technical control. For example, when it comes to *balance of metrics*, the measures being evaluated are the ones being expressed by employees. With more experience within the company, employees are more likely to have had time to understand the organization holistically, including understanding what is being measured and by extension also how these measures connect to strategy and performance, leading to increased scoring in *awareness of causal relationship* as well. Newer employees may not be aware of this yet.

One of the most notable issues, and the one cause for the highest discrepancies in scoring, is the lacking *frequency of performance reviews* across all departments except product. The product team is the only team expressing any structured follow-ups and reviews on measures, while employees from other departments are in agreement that very little is done in their respective departments. Of note, and as previously mentioned, managers for warehouse, workshop, and sales are new. They both express their eagerness to improve their performance measurement practices and believe that it will greatly benefit the organization. As of the point in time when the assessment was conducted, however, performance reviews are lacking, preventing the managers from using these measures to clearly direct the work of the employees. This also affects the scoring in *manager's accountability and control.*

This lack of performance reviews could also be a reason for the lack of connection to the targets by employees. If performance reviews are not present, it becomes hard for employees to understand what is being measured and why, meaning that potential targets are unknown and unlikely to affect the direction of the work of the employees, which is required for a high maturity in *targets and incentives linking to strategic objectives.* While the workshop still scores high because the targets technically exist, they are unable to compare to the product team since the targets have little actual bearing on their work.

For *reporting of measures and their trends*, the product team and sales score the highest. If nothing else, this makes sense intuitively, as the product team and the sales team are the departments whose working tasks are more “digital”, as opposed to the warehouse and workshop, whose tasks in general are more physical, with the products themselves.

The optimal degree of maturity within technical control, as in the degree of maturity that leads to the best performance, is not necessarily the highest. As Smith and Bititci (2017) show in their study, an intervention to increase social control could require a decrease in technical control but still increase employee engagement and performance, and too high technical control could lead to low employee engagement. As posed by contingency theory (Nugraha & Soewarno, 2024), no single control system is suitable for all organization and in all situations, and the desired extent of maturity is dependent on the desires of management and the working circumstances in the department. An example would be that tracking too many measures could be difficult to keep track of for employees, inhibiting the measures’ ability to direct their work, or that too short control intervals would be too time-consuming for the benefits they potentially bring.

5.2 Social control

When examining the company at an overall level, the workshop, warehouse, and sales departments score similarly on the social dimension, while the product department scores slightly higher. One potential explanation for these relatively similar social scores is that the company is an SME. In such organizations, management practices and the social environment tend to be more homogeneous than in larger firms with more physically and structurally separated departments.

Looking more closely at departmental contexts, the workshop and warehouse departments share the same manager. Although their tasks differ, both roles are primarily physical and characterized by clear, semi-routine work processes. These contextual similarities may help explain why their social dimension scores are nearly identical. In contrast, the sales and product teams have different managers and perform different types of work; however, both operate predominantly in a digital environment. Despite this shared characteristic, these departments show greater variation in their social scores, which may be attributed to differences in managerial approach and work context.

Further analysis suggests a correlation between departments' social dimension scores and their employee engagement scores. This finding aligns with the framework proposed by Smith and Bititci (2017), which indicates that increases in social control are associated with higher employee engagement. Several factors are known to contribute to employee engagement, including skill variety, reward and recognition, and autonomy (Saks, 2019). These factors closely resemble the dimensions assessed in this study – namely *job enrichment and multiskilling*, *reward and punishment*, and *autonomy and self-management with loose controls* – which may help explain the observed correlation between social scores and employee engagement.

Psychological safety may provide an additional explanation for this relationship. Previous research has shown psychological safety to be strongly associated with employee engagement, and it may even be a prerequisite for engagement (Allen & Magill, 2025). Psychological safety has also been linked to organizational learning capabilities (Bransby et al., 2025; Edmondson, 1999), as has participative decision-making (Chiva & Alegre, 2009).

Although this study does not directly measure learning capability at the departmental level, it could be hypothesized to relate to our factors such as *job enrichment and multiskilling*, *reward and punishment* and *autonomy and self-management with loose controls*. However, no clear correlation is observed between psychological safety and these factors. One possible explanation is that the selected factors capture the presence and maturity of structures supporting learning behaviours, rather than the effectiveness of the learning behaviours themselves.

From a broader perspective, it is important to note that there is no known optimal score for social control. Smith and Bititci (2017) demonstrate that excessively high technical control can negatively affect both employee engagement and organizational performance, and a similar effect may apply to social control. Moreover, the optimal level of social control is likely context-dependent and influenced by the type of work performed. Consequently, it cannot be concluded that one score is inherently better or worse than another.

Finally, it is important to recognize that not all types of work benefit from high levels of autonomy or complexity. For example, a high score in work enrichment is not necessarily desirable in all cases, as employee engagement may not increase for individuals who do not have a strong need for personal growth (Hackman & Oldham, 1975). Therefore, before increasing work enrichment, careful consideration should be given to whether employees seek professional and personal development. Additionally, certain tasks and roles may not be well suited to high autonomy or complexity. Warehouse tasks, for instance, are typically simple in nature, and introducing additional complexity would likely not yield the intended benefits.

5.3 Academic contribution

Smith and Bititci (2017) propose that there is an interplay between performance measurement and performance management – technical and social control – and that intervening to affect one of them can have implications on the other. They further define sets of criteria that constitute technical and social control. However, Smith and Bititci do not provide specifics about how an assessment of these criteria can be made, or how we can explicitly differentiate between different levels of technical and social control. Their own initial assessment of technical and social control within the company in question for their study is brief.

To assess the levels of maturity within technical and social control of an organization, our study provides a concrete way of using the criteria set out by Smith and Bititci (2017). This is done by gathering data (in our case through interviews and surveys) on the criteria in question and empirically constructing requirements for reaching specific levels of maturity, and assigning scores based on the data collected.

By defining sets of requirements that are applicable across all departments assessed, we provide a tangible way of conducting an assessment, which can be used by researchers and managers alike. For managers of an organization, it can be used to assess departments in relation to one another on the maturity of technical and social control, to see which departments are not aligned in these areas to the desired extent. The scores assigned to the different criteria can provide guidance on what areas should be focused on to make sure that the performance measurement systems and the performance management practices are thorough and well-balanced. One example would be to do an initial assessment of several departments and based on this assessment design and implement an intervention to address the issues found. Once changes are in place and time has passed, the assessment can be performed again, to see if the intervention had the desired effect or if a differently designed intervention is needed.

For researchers, our study contributes by providing a clear way to measure technical control and social control. By using our method, researchers could further explore the nature of the interplay between performance measurement, performance management, employee engagement and performance, making it easier to test the findings of Smith and Bititci (2017) in the future. But our method can also be applied for measuring performance measurement and management, individually or together, in other areas of research.

In their study, Smith and Bititci (2017) use their framework to suggest an interplay between performance measurement, performance management, employee engagement and performance. They show this by using an intervention, implementing operational changes across several teams that slightly decrease technical control while significantly increasing social control, which results in increased employee engagement and performance.

Our study does not assess the performance of the different departments, nor does it include an intervention with operational changes. As such, it does not aim to replicate the findings of Smith and Bititci (2017) in terms of the aforementioned interplay, as it would have required time that was unavailable for this study for the additional activities required. These include proposing changes to operations across all departments, implementing the changes, letting enough time pass for the departments to become accustomed to and use them, and then once more assess the departments, to ultimately compare the second assessment to the previous assessment and evaluate the correlation with employee engagement and performance. Time for all these activities did not fit in the scope of our master's thesis.

Even if we would have had access to a similar time frame as Smith and Bititci (2017), the different organizational environments would have limited our ability to replicate their method. For example, Smith and Bititci performed their study at a larger company, which featured several departments of similar operational nature. As such, they had access to use of control groups where the intervention was not performed, ascertaining that changes in performance of departments were not caused by other factors than the intervention itself. As the company in question for our study is small and only has one of each kind of department, the use of control groups would not have been available to us.

5.4 Managerial implications

The warehouse, workshop and sales have less maturity than product in both dimensions. If the desire is for all groups to show the characteristics of a high score, efforts should be focused primarily outside of the product team.

To score higher on the performance measurement system each department needs a balanced set of metrics. These would need to be reviewed regularly, frequently and be accessible, to increase their awareness and strategic value of them. The metrics would need to be at a relevant level for the departments with a clear connection to the business plan, and with clearly defined targets.

While the measures known and expressed by employees are balanced in three out of four departments, there are some diminishing circumstances regarding their implementation in sales and the workshop, where issues surrounding measurement and their uses are expressed (hence the lower scores). It is important for managers to consider not only whether measurements are conducted in theory, but also the perspective of the employees in relation to the measures. If employees feel that measures are unfair, poorly measured or if they do not understand the connection to strategic goals and/or performance, it is less likely that they will accept the measures and goals as something to strive towards. From what we can see from the interview data, efforts should be made to ensure that employees understand, acknowledge and appreciate the measures used.

What is clear is that a majority of employees do not feel that whether they reach or not reach their targets affects their work. This is an opportunity for improvement. Giving employees incentives – not necessarily in monetary terms – and/or a clear sense of connection to the targets increases the likelihood that employees will engage with them, prompting them to put more effort in to increase their own performance and subsequently contribute to organizational performance.

However, one can understand that it might be difficult for an employee to connect to the targets when there is little effort from an organizational point of view to provide feedback and performance reviews regarding said targets. From the interview data and the scoring, it is evident that this is another opportunity for improvement. Many employees express that it would be interesting to follow up on the numbers and that it would be beneficial for them to receive more tangible individual feedback. By focusing efforts on implementation of structured performance review practices, similarly to the ones found in the product team, employees would get a clearer understanding of the usage of measures within the company, as to let it guide them towards improving their own performance, to ultimately reach targets set out by the management team.

Moving on, to score higher on performance management, one concrete suggestion is to regularly schedule time for reflection and improvement. While there is a culture of continuously making suggestions and improvements, the organization might benefit from working more systematically to find ways to identify improvement opportunities. This connects clearly to the lack of performance reviews, and as such, consistently allotting time for reflection and review is something which stands to benefit the company greatly.

Furthermore, all departments score low on *reward and punishment*. While monetary reward and punishment in general might not be suitable for this company, there is still room for improvement. The company could provide more clear feedback and recognition. For instance, the workshop employees express a desire for more individual feedback, as the feedback currently given is on a group level and individuals do not know if they caused errors. Giving individual feedback might help the employee remember the error until next time. Of course, this would need to be done in a constructive and non-blaming manner.

As mentioned previously, an important consideration for management is that not every department might necessarily benefit from the same position in Smith and Bititci's (2017) framework. While Bititci (2015) argues that a balance between technical and social control needs to be reached, it is not clear how to optimally balance these two. It is not clear if this point of optimal balance would be optimal in all departments and organizations. In other words, it is not possible to say, objectively, if the current balance for each department is sub-optimal, nor if they should strive for the same balance. It is up to the management team to interpret the results to see whether each department is in a desirable position and design an intervention accordingly.

6. Conclusion

In this chapter, we conclude by looking back at the purpose of the study, discuss some limitations with the study, and finally look ahead at potential future research.

6.1 Research Questions

This study aimed to assess the level of maturity of the individual departments of the company in regard to performance measurement and management, as well as to understand how such an assessment can be conducted. For this purpose, we devised two research questions, which we review below.

6.1.1 Research Question 1

On the topic of what to consider when assessing maturity levels for performance management and measurement, we have shown that assessment can be made by considering the criteria that constitute performance measurement and management and subsequently developing requirements for these criteria based on empirical data. In our case, we collected this data through interviews and surveys. This process can be applied in other contexts, but the requirements for each level of maturity are relative. For each assessment, it is therefore required to assess more than one organizational unit.

6.1.2 Research Question 2

Our study was able to assess the level of maturity of each department and found that, for performance measurement/technical control, the product department scores the highest, the workshop and sales scores similarly to one another, and the warehouse scores significantly lower. For performance management/social control, three out four departments show a similar maturity, while the product department shows a significantly higher maturity. These findings will hopefully help the management at the studied company to identify where efforts should be directed for the company to become more decentralized, as is their wish. Noteworthy managerial implications include that employees do not feel a connection to the targets set by the company and that there is a lack of allotted time for performance reviews and feedback overall. Both of these are true for all departments except for the product team. At the same time, it is not known if a higher maturity on the respective dimensions always leads to increased organizational performance. Here, careful consideration needs to be done by the management before any intervention.

6.2 Limitations

While our method for assessing technical and social controls sets out to result in a tangible and clear assessment, some consideration is due before using the assessment to design an intervention.

The assessment is strongly dependent on what data was collected: the employees’ answers in both the interviews and the survey. If any relevant factors were not brought up during the interviews by the employees, or if brought up factors were misinterpreted by the authors, it might affect the results of this study. Furthermore, the survey and interviews were not performed at the same time for each employee, which means that there is a risk that the employees' perceptions might have changed during the time in between.

Furthermore, as the studied company is small, quantitative data poses problems of reliability. If only a few individuals have misunderstood the questions in the survey, for example, this has the potential to partially skew results. Attempting to overcome this possibility was done through triangulation between interview and survey data.

The interview questions were refined continuously during the interview period, to be able to extract the correct data from the interviews. This might lead to incompleteness of data as not every interviewee answered the exact same questions. Additionally, since the matrices were developed during and after the interviews, another set of interviews would have been beneficial. In that way, the interview questions could have more closely connected to the framework, reducing the risk of missing out on relevant data.

6.3 Future research

Through the methods in our study, future research could more easily assess the interplay between performance measurement, performance management, employee engagement and performance, but it could also be used outside of this context. The requirements we have developed for each criterion are empirically constructed, and as such are unlikely to be applicable if attempting an assessment in other settings. Instead, for each instance, requirements need to be formulated after data has been gathered and requires comparative data from several different departments or organizations to construct relative levels of maturity. Thus, one potential area for future research is the creation of standardized requirements. One way to do this would be to perform assessments across a variety of departments across different organizations, developing requirements that are applicable across similar organizations (or, if broadening the scope even further, across industries). The outcome of such research could be used to further facilitate the assessment of performance measurement and management, giving managers pre-defined requirements to base their assessment on instead of spending time creating their own.

References

Alderman, L., & Murray, S. (2025). Benchmarking: Seeking Best Practice. *New Directions for Evaluation*, *2025*(185–186), 25–32. https://doi.org/10.1002/ev.20634

Allen, J. A., & Magill, M. S. (2025). Psychological safety and engagement: The importance of collaboration and experience. *Journal of Management Development*, 1–15. https://doi.org/10.1108/JMD-04-2024-0148

Barnes, C., & Walker, R. (2010). Improving corporate communications: Lean Six Sigma science has broad reach. *Journal of Business Strategy*, *31*(1), 23–36. https://doi.org/10.1108/02756661011012750

Bititci, U. S. (2015). *Managing business performance: The science and the art*. Wiley.

Bititci, U. S., Carrie, A. S., & McDevitt, L. (1997). Integrated performance measurement systems: A development guide. *International Journal of Operations & Production Management*, *17*(5), 522–534. https://doi.org/10.1108/01443579710167230

Bititci, U. S., Garengo, P., Ates, A., & Nudurupati, S. S. (2015). Value of maturity models in performance measurement. *International Journal of Production Research*, *53*(10), 3062–3085. https://doi.org/10.1080/00207543.2014.970709

Bransby, D. P., Kerrissey, M. J., & Edmondson, A. C. (2025). Paradise Lost (and Restored?): A Study of Psychological Safety over Time. *Academy of Management Discoveries*, *11*(3), 403–422. https://doi.org/10.5465/amd.2023.0084

Campion, M. A., & Thayer, P. W. (1985). Development and Field Evaluation of an Interdisciplinary Measure of Job Design. *Journal of Applied Psychology*, *70*(1), 29–43.

Chiva, R., & Alegre, J. (2009). Organizational Learning Capability and Job Satisfaction: An Empirical Assessment in the Ceramic Tile Industry. *British Journal of Management*, *20*(3), 323–340. https://doi.org/10.1111/j.1467-8551.2008.00586.x

Cocca, P., & Alberti, M. (2010). A framework to assess performance measurement systems in SMEs. *International Journal of Productivity and Performance Management*, *59*(2), 186–200. https://doi.org/10.1108/17410401011014258

Davis, S., & Albright, T. (2004). An investigation of the effect of Balanced Scorecard implementation on financial performance. *Management Accounting Research*, *15*(2), 135–153. https://doi.org/10.1016/j.mar.2003.11.001

Douwe P. Flapper, S., Fortuin, L., & Stoop, P. P. M. (1996). Towards consistent performance management systems. *International Journal of Operations &*

Production Management, *16*(7), 27–37. https://doi.org/10.1108/01443579610119144
Edmondson, A. (1999). Psychological Safety and Learning Behavior in Work Teams. *Administrative Science Quarterly*, *44*, 350–383.
Eisenhardt, K. M. (1985). Control: Organizational and Economic Approaches. *Management Science*, *31*(2), 134–149. https://doi.org/10.1287/mnsc.31.2.134
European Commission. (2020). *User guide to the SME definition.* Publications Office. https://data.europa.eu/doi/10.2873/677467
Franco-Santos, M., Lucianetti, L., & Bourne, M. (2012). Contemporary performance measurement systems: A review of their consequences and a framework for research. *Management Accounting Research*, *23*(2), 79–119. https://doi.org/10.1016/j.mar.2012.04.001
Garengo, P. (2009). A performance measurement system for SMEs taking part in Quality Award Programmes. *Total Quality Management & Business Excellence*, *20*(1), 91–105. https://doi.org/10.1080/14783360802614307
Garvin, D. A. (1983). Quality on the line. *Harvard Business Review*, *61*(5), 64–75.
Hackman, J. R., & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology*, *60*(2), 159–170. https://doi.org/10.1037/h0076546
Heinicke, A. (2018). Performance measurement systems in small and medium-sized enterprises and family firms: A systematic literature review. *Journal of Management Control*, *28*(4), 457–502. https://doi.org/10.1007/s00187-017-0254-9
Ittner, C. D. (2008). Does measuring intangibles for management purposes improve performance? A review of the evidence. *Accounting and Business Research*, *38*(3), 261–272. https://doi.org/10.1080/00014788.2008.9663338
Kaplan, R., & Norton, D. (1992). The Balanced Scorecard—Measures That Drive Performance. *Harvard Business Review*, *70*(1), 71–79.
Luft, J. (2016). Cooperation and competition among employees: Experimental evidence on the role of management control systems. *Management Accounting Research*, *31*, 75–85. https://doi.org/10.1016/j.mar.2016.02.006
Mackenzie, H., & Bititci, U. (2024). Reconceptualising performance measurement and management: Evaluating a social complexity framework. *Journal of Organizational Effectiveness: People and Performance*. https://doi.org/10.1108/JOEPP-03-2024-0093
Mackenzie, H., & Bititci, U. S. (2023). Understanding performance measurement and management as a social system: Towards a theoretical framework. *International Journal of Operations & Production Management*, *43*(7), 1098–1120. https://doi.org/10.1108/IJOPM-05-2022-0349

Medori, D., & Steeple, D. (2000). A framework for auditing and enhancing performance measurement systems. *International Journal of Operations & Production Management*, *20*(5), 520–533. https://doi.org/10.1108/01443570010318896

Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ): Developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology*, *91*(6), 1321–1339. https://doi.org/10.1037/0021-9010.91.6.1321

Neely, A., Gregory, M., & Platts, K. (1995). Performance measurement system design: A literature review and research agenda. *International Journal of Operations & Production Management*, *15*(4), 80–116. https://doi.org/10.1108/01443579510083622

Nugraha, A. P., & Soewarno, N. (2024). An evaluation on the implementation of management control in industrial companies according to contingency theory. *Journal of Applied Management*, *22*(2), 562–574.

Oliver, N. (1994). *Worldwide Manufacturing Competitiveness Survey: The Second Lean Enterprise Report.* https://doi.org/10.13140/RG.2.2.35803.57122

Pavlov, A., & Micheli, P. (2023). Rethinking organizational performance management: A complexity theory perspective. *International Journal of Operations & Production Management*, *43*(6), 899–915. https://doi.org/10.1108/IJOPM-08-2022-0478

Poole, M., Lansbury, R., & Wailes, N. (2001). A Comparative Analysis of Developments in Industrial Democracy. *Industrial Relations: A Journal of Economy and Society*, *40*(3), 490–525. https://doi.org/10.1111/0019-8676.00221

Saks, A. M. (2019). Antecedents and consequences of employee engagement revisited. *Journal of Organizational Effectiveness*, *6*(1), 19–38. (edselc.2-52.0-85061488202). https://doi.org/10.1108/JOEPP-06-2018-0034

Sims, H. P., Szilagyi, A. D., & Keller, R. T. (1976). The Measurement of Job Characteristics. *Academy of Management Journal*, *19*(2).

Smith, M., & Bititci, U. S. (2017). Interplay between performance measurement and management, employee engagement and performance. *International Journal of Operations & Production Management*, *37*(9), 1207–1228. https://doi.org/10.1108/IJOPM-06-2015-0313

Speckbacher, G., Bischof, J., & Pfeiffer, T. (2003). A descriptive analysis on the implementation of Balanced Scorecards in German-speaking countries. *Management Accounting Research*, *14*(4), 361–388. https://doi.org/10.1016/j.mar.2003.10.001

Van Aken, E. M., Letens, G., Coleman, G. D., Farris, J., & Van Goubergen, D. (2005). Assessing maturity and effectiveness of enterprise performance measurement systems. *International Journal of Productivity and Performance Management*, *54*(5/6), 400–418. https://doi.org/10.1108/17410400510604557

Wettstein, T., & Kueng, P. (2002). A maturity model for performance measurement systems. *Management Information Systems*.

Wilson, A. (2004). How process defines performance management. *International Journal of Productivity and Performance Management*, *53*(3), 261–267. https://doi.org/10.1108/17410400410523792

Appendices

Appendix A. Survey Questions

Job enrichment and multiskilling

- Mitt arbete innebär en stor variation av arbetsuppgifter.
- Mitt arbete kräver att jag använder flera olika färdigheter för att kunna utföra arbetsuppgifterna.

Autonomy and self-management with loose controls

- Mitt arbete låter mig ta egna beslut kring hur jag schemalägger arbetet.
- Mitt arbete ger mig möjlighet att använda eget omdöme och initiativ när jag utför mina arbetsuppgifter.
- Mitt arbete låter mig själv bestämma vilka metoder jag använder för att slutföra mina arbetsuppgifter.

Participation and industrial democracy

- I mitt team lägger vi tid på att diskutera teamets plan, syfte, mål och förväntningar för vårt arbete.
- Som medlem i teamet har jag reellt inflytande över hur teamet genomför sitt arbete.
- Mitt team uppmuntrar alla att aktivt delta i beslutsfattandet.

Psychological safety

- Medlemmarna i mitt team uppmärksammar varandras insatser och hårda arbete.
- Jag känner att jag fritt kan ifrågasätta beslut eller agerande från personer med mer auktoritet.
- Jag känner mig fri att ta upp misstag, problem och andra svåra frågor.
- Det är svårt att be andra personer i företaget om hjälp

Appreciating differences and being open to new ideas

- I mitt team är vi alltid mottagliga för att lyssna på våra kollegors nya idéer
- I mitt team är vi uppmärksamma på nya möjligheter som kan göra vårt arbete mer effektivt
- Medlemmarna i mitt team kan acceptera människor som är olika.

Creating time for idea sharing and reflection

- I mitt team avsätter vi regelbundet tid för hitta sätt att förbättra teamets arbetsprocesser.
- I mitt team ser någon alltid till att vi stannar upp och reflekterar över teamets arbetsprocesser
- I mitt team är det vanligt att man lyfter frågor som utmanar rådande antaganden.

Specialization and demarcation of work

- Mina arbetsuppgifter är mestadels enkla och okomplicerade.
- Mina arbetsuppgifter kretsar kring ett smalt och tydligt avgränsat område.

Prescribed activities and tight controls

- Jag känner ibland att jag inte får arbeta med mina arbetsuppgifter på det sätt jag själv hade velat.

Internal competition

- I mitt team jämförs medlemmar ofta med varandra baserat på sin prestation.
- Jag känner press att prestera bättre än mina kollegor.
- I mitt team känner jag ofta att jag konkurrerar med kollegor om uppmärksamhet eller karriärsmöjligheter.

Reward and Punishment

- I mitt team uppmärksammas eller belönas goda prestationer.
- I mitt team leder svaga prestationer ofta till negativa konsekvenser.
- Belöningar eller erkännanden i mitt team är starkt kopplade till tydligt mätbara resultat.
- Jag förstår hur min prestation utvärderas.

Employee Engagement

- Ibland blir jag så uppslukad av mitt arbete att jag tappar tidsuppfattningen.
- Jag tappar ofta fokus och börjar tänka på annat när jag jobbar
- Jag känner ett starkt engagemang för mitt arbete.
- Det känns motiverande och stimulerande att vara del av det här företaget
- Jag känner ett starkt engagemang för företaget som helhet

Appendix B. Swedish-English translations

Questions in Swedish	Questions in English
Mitt arbete innebär en stor variation av arbetsuppgifter.	My job involves a great deal of task variety.
Mitt arbete kräver att jag använder flera olika färdigheter för att kunna utföra arbetsuppgifterna.	My job requires me to utilize a variety of different skills in order to complete the work.
Mitt arbete låter mig ta egna beslut kring hur jag schemalägger arbetet.	The job allows me to make my own decisions about how to schedule my work.
Mitt arbete ger mig möjlighet att använda eget omdöme och initiativ när jag utför mina arbetsuppgifter.	The job gives me a chance to use my personal initiative or judgment in carrying out the work.
Mitt arbete låter mig själv bestämma vilka metoder jag använder för att slutföra mina arbetsuppgifter.	The job allows me to make decisions about what methods I use to complete my work.
I mitt team lägger vi tid på att diskutera teamets plan, syfte, mål och förväntningar för vårt arbete.	In my team, we spend time discussing our team's plan, purpose, goals, and expectations for our project.
Som medlem i teamet har jag reellt inflytande över hur teamet genomför sitt arbete.	As a member of this team, I have a real say in how this team carries out its work.
Mitt team uppmuntrar alla att aktivt delta i beslutsfattandet.	My team supports everyone actively participating in decision making.
Medlemmarna i mitt team uppmärksammar varandras insatser och hårda arbete.	The members of my team recognize each other's accomplishments and hard work.
Jag känner att jag fritt kan ifrågasätta beslut eller agerande från personer med mer auktoritet.	I feel free to question the decisions or action of those with more authority
Jag känner mig fri att ta upp misstag, problem och andra svåra frågor.	I feel free to bring up mistakes, problems and tough issues
Det är svårt att be andra personer i företaget om hjälp.	It is difficult to ask other members of this organization for help (reverse scored)
I mitt team är vi alltid mottagliga för att lyssna på våra kollegors nya idéer.	In my team, we are always open to listening to our co-workers' new ideas
I mitt team är vi uppmärksamma på nya möjligheter som kan göra vårt arbete mer effektivt.	In my team, we are attentive to new opportunities that can make our system more efficient and effective
Medlemmarna i mitt team kan acceptera människor som är olika.	The members of my team know how to accept people who are different
I mitt team avsätter vi regelbundet tid för att hitta sätt att förbättra teamets arbetsprocesser.	We regularly take time to figure out ways to improve our organization's work processes
I mitt team ser någon alltid till att vi stannar upp och reflekterar över teamets arbetsprocesser	In this organization, someone always makes sure that we stop to reflect on the organization's work process
I mitt team är det vanligt att man lyfter frågor som utmanar rådande antaganden.	People in this team are encouraged to speak up to test assumptions about issues under discussion.
Mina arbetsuppgifter är mestadels enkla och okomplicerade.	My tasks on the job are simple and uncomplicated

Mina arbetsuppgifter kretsar kring ett smalt och tydligt avgränsat område.	My job is highly specialized in terms of purpose, tasks, or activities.
Jag känner ibland att jag inte får arbeta med mina arbetsuppgifter på det sätt jag själv hade velat.	I sometimes feel constricted in the way I am able to work with my tasks.
I mitt team jämförs medlemmar ofta med varandra baserat på sin prestation.	In my team, members are often compared to one another based on their performance
Jag känner press att prestera bättre än mina kollegor.	I feel pressured to outperform my coworkers.
I mitt team känner jag ofta att jag konkurrerar med kollegor om uppmärksamhet eller karriärsmöjligheter.	In my team, I often feel like I compete with my colleagues for recognition or opportunities.
I mitt team uppmärksammas eller belönas goda prestationer.	In my team, good performance is clearly recognized by management
I mitt team leder svaga prestationer ofta till negativa konsekvenser.	In my team, poor performance often leads to negative consequences
Belöningar eller erkännanden i mitt team är starkt kopplade till tydligt mätbara resultat.	Rewards and/or recognition in my team is strongly linked to achieving measurable results
Jag förstår hur min prestation utvärderas.	I understand the way in which my performance is evaluated by management
Ibland blir jag så uppslukad av mitt arbete att jag tappar tidsuppfattningen.	Sometimes I am so into my job that I lose track of time.
Jag tappar ofta fokus och börjar tänka på annat när jag jobbar.	My mind often wanders and I think of other things when doing my job (R).
Jag känner ett starkt engagemang för mitt arbete.	I am highly engaged in this job.
Det känns motiverande och stimulerande att vara del av det här företaget.	Being a member of this organization is very captivating
Jag känner ett starkt engagemang för företaget som helhet.	I am highly engaged in this organization.

Appendix C. Interview questions in Swedish

Technical control

- Finns det mål inom din avdelning?
- Vad mäter ni för närvarande?
    - Hur ofta görs mätningarna?
- Varför mäter ni?
    - Vet du hur det relaterar till era strategiska mål?
- Vad tycker du är viktigt att ni mäter inom din avdelning?
    - Hur vet du om du har gjort ett bra jobb? / Hur vet du att ni ligger i fas?
- Vet du om (och isåfall hur) resultatet av mätningarna analyseras?
- På vilket sätt påverkas du om målen uppnås?
    - eller inte uppnås?
- Vad händer om ett mål inte uppnås, i din avdelning?
    - Hur fördelas ansvaret för att nå målen, och vad händer om de inte uppnås?
- Vilka får kännedom om resultaten av mätningarna?
- Hur får personer i organisationen kännedom om resultaten?
    - Är det möjligt för medarbetare att komma åt resultaten på egen hand?
- Hur ofta följer ni upp nyckeltalen?
    - Tas det bara upp om det är bra dåligt eller bra?

Social control

- Kan du själv välja hur du lägger upp din arbetsdag?
- Hur mycket rutin kontra problemlösning är det i ditt arbete?
- Händer det att du känner dig begränsad i ditt arbete av regler eller policys?
- Vad tar ni för gemensamma beslut i teamet?
- När nya idéer eller förbättringsförslag dyker upp, hur brukar de hanteras i teamet och organisationen?
    - Har ni någon avsatt tid för att prata om det, eller är det på vanliga möten?
- Hur lätt är det att prata öppet om misstag, utmaningar eller sånt som kan skapa konflikt?
- Hur skulle du beskriva stämningen mellan kollegor och/eller avdelningar?
    - Är det bra samarbete, eller förekommer det konkurrens och/eller jämförelser?

DEPARTMENT OF TECHNOLOGY MANAGEMENT AND ECONOMICS
DIVISION OF INNOVATION AND R&D MANAGEMENT
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden
www.chalmers.se

CHALMERS
UNIVERSITY OF TECHNOLOGY