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Developing a Power BI-based Procurement Performance Dashboard for a Centralized Procurement Team

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ABSTRACT:

This thesis examines how a Power BI-based procurement performance dashboard can be developed to support the information needs of a newly established centralized procurement team. The study was conducted as a design science-oriented single case study for Insta Automation Oy, where the aim was to identify relevant procurement performance indicators, analyze current reporting challenges and available data sources, and develop a dashboard artefact that supports both operational follow-up and managerial decision-making. The theoretical background of the study combines literature on performance measurement, procurement performance measurement, business intelligence, and dashboards.

The empirical material consisted of nine semi-structured interviews with procurement professionals in different roles and ERP data from the company's IFS system. The qualitative interview data were analyzed using thematic analysis to identify recurring information needs, reporting problems, and dashboard design requirements. The findings show that the main challenge was not the absence of potentially useful metrics, but the lack of accessible, reliable, and role-relevant procurement information in one place. Four central themes were identified: data availability and reliability, workload visibility and operational follow-up, supplier performance and spend for decision-making, and usability and integration into daily work. Based on these findings, a Power BI dashboard was designed with a hybrid structure combining a shared overview page, role-specific views, and a cross-role supplier page.

The study concludes that a procurement performance dashboard can support a centralized procurement team effectively when it is grounded in user information needs, linked to multidimensional procurement performance literature, and implemented within the constraints and possibilities of the existing data environment. The developed dashboard represents a feasible first artefact for the case company, although further evaluation and iterative development are needed to assess its long-term effects in practice.

KEYWORDS: procurement performance measurement, dashboard, power bi, business intelligence, centralized procurement

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TIIVISTELMÄ:

Tässä tutkielmassa tarkastellaan, kuinka Power BI -pohjainen hankinnan suorituskykymittaristo voidaan kehittää tukemaan keskitetyn hankintatiimin tiedontarpeita projektiliiketoimintaa harjoittavassa teollisessa ympäristössä. Tutkimus toteutettiin design science -henkisenä yksittäisenä tapaustutkimuksena Insta Automation Oy:lle. Työn tavoitteena oli tunnistaa hankinnan kannalta olennaiset suorituskykymittarit, analysoida nykyiset raportointihaasteet ja käytettävissä olevat tietolähteet sekä kehittää dashboard-artefakti, joka tukee sekä operatiivista seurantaa että johtamisen tarpeita.

Tutkimuksen teoreettinen viitekehys yhdistää suorituskyvyn mittaamisen, hankinnan suorituskyvyn mittaamisen, business intelligence -ratkaisujen ja dashboardien kirjallisuutta. Empiirinen aineisto koostui yhdeksästä puolistrukturoidusta haastattelusta eri hankintarooleissa toimivien henkilöiden kanssa sekä yrityksen IFS-toiminnanohjausjärjestelmästä saadusta ERP-datasta. Laadullinen aineisto analysoitiin temaattisella analyysillä, jotta voitiin tunnistaa toistuvat tiedontarpeet, raportoinnin ongelmat ja dashboardin suunnittelua ohjaavat vaatimukset. Tulokset osoittavat, että keskeinen ongelma ei ollut käyttökelpoisten mittareiden puute, vaan helposti saatavan, luotettavan ja roolikohtaisesti relevantin tiedon puuttuminen yhdestä paikasta. Aineistosta tunnistettiin neljä keskeistä teemaa: datan saatavuus ja luotettavuus, työkuorman näkyvyys ja operatiivinen seuranta, toimittajasuorituskyky ja ostovolyymin näkyvyys päätöksenteon tukena sekä käytettävyys ja integroituminen päivittäiseen työhön. Näiden havaintojen pohjalta suunniteltiin Power BI -dashboard, jonka rakenne yhdistää yhteisen yleisnäkymän, roolikohtaiset sivut ja eri rooleja palvelevan toimittajanäkymän.

Tutkimuksen perusteella hankinnan suorituskyky-dashboard voi tukea keskitettyä hankintatiimiä tehokkaasti silloin, kun se perustuu käyttäjien tiedontarpeisiin, nojaa moniulotteiseen hankinnan suorituskyvyn kirjallisuuteen ja toteutetaan olemassa olevan data-arkkitehtuurin mahdollisuudet ja rajoitteet huomioiden. Kehitetty dashboard edustaa tapausyritykselle toteuttamiskelpoista ensimmäistä artefaktia, mutta sen pitkäaikaisvaikutusten arviointi edellyttää jatkokehitystä ja laajempaa käytännön evaluointia.

KEYWORDS: hankinnan suorituskyvyn mittaaminen, dashboard, power bi, business intelligence, keskitetty hankinta

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1 Introduction

This introduction chapter is about introducing the background of the study and explains why procurement performance measurement and business intelligence-based dashboards are relevant topics in the context of procurement and especially in centralized procurement. Also in this chapter the research problem, the objectives and delimitations of the study, introduction of the case company and the overall structure of the thesis is presented.

1.1 Background

n today's business world measuring different metrics has become a critical thing to companies. My thesis will go through world of modern procurement management and measuring performance there. The actual role of procurement has expanded beyond routine purchasing tasks toward a larger scale responsibility for cost management, supplier performance, delivery capability, and support for business goals (Van Weele, 2018). Van Weele (2018) state also that at the same time organizations increasingly expect procurement to provide timely and reliable information for both operational follow-up and managerial decision-making. Neely et al., (2005) told about this development already in 2005 and its increased importance of procurement performance measurement as a practical management tool rather than a purely reporting oriented activity.

In general, performance measurement is understood as a means to make organizational activities more visible, more comparable and more manageable in relation to intended goals (Neely et al., 2005). Although the usefulness of measurement depends less on the number of indicators than on whether the selected measures are connected to decision-making and to the strategic priorities of the organization (Bourne et al., 2003). In field of procurement, this means that performance information should help users monitor relevant issues such as cost, delivery performance, supplier-related outcomes and process

efficiency in a way that supports everyday work and long-term development (Van Weele, 2018).

1.2 The Case Company

This thesis is conducted as a case study for company called Insta Automation Oy. Insta Automation is a part of the Insta Group. Insta Automation have now newly started centralized procurement team, where I work currently and where this thesis is related to. Insta is a Finnish technology company with over 60 years of experience in industrial automation, electrification, instrumentation, and digitalization solutions. Insta Automation delivers demanding industrial projects ranging from basic engineering and cabinet manufacturing to installation, commissioning, and long-term maintenance services (Insta, n.d.). So this thesis as said is for the Insta Automation's new procurement team, which is responsible for sourcing materials, components, and services required for customer projects and internal operations. Procurement team plays critical role in Insta Automation's project based and turn-key nature business model, where they ensure timely deliveries, cost efficiency, quality compliance, and supplier coordination.

This thesis is relevant for the case company, because the company are in the situation now, where they have relevant setting for measuring performance. People, the procurement team, reporting tools, and the data is available and the company do not start beginning where there is completely absence of reporting. The research problem is therefore not only about defining procurement metrics in theory, but about translating available ERP data scattered reporting practices into a unified Power BI based dashboard solution. This will hopefully support better procurement work, decision making, and performance visibility in a fine project-intensive industrial service business.

1.3 Research Question and Objectives

This thesis addresses the practical need to develop a comprehensive procurement performance dashboard for a centralized procurement team. This purpose of the thesis is achieved by accomplishing these three objectives:

- Identifying relevant procurement performance indicators from literature and from the company needs.
- Analysing the company's current reporting challenges and data sources.
- Design and implement a Power BI-based dashboard that visualizes key procurement KPIs, following BI/dashboard research and best practices

Based on these three objectives, the main research question of this thesis is:

How can a Power BI-based procurement performance dashboard be developed to support the information needs of a centralized procurement team?

This question arises from the practical need to make procurement related data more usable for different roles within the case company and from broader academic discussion on how performance measurement and dashboard solutions can support organizational decision making (Yigitbasioglu & Velcu, 2012). The thesis does not approach the dashboard and its creation merely as a technical reporting tool, but as an artefact that should reflect the performance dimensions, information priorities, and work practices for its intended users.

1.4 Scope and Delimitation

The scope of this thesis is the development of a Power BI based procurement performance dashboard for a centralized procurement team in one manufacturing business unit. It includes focus on the information needs of this team and on the procurement performance indicators that are relevant for decision making in its daily and managerial work. The scope also includes the analysis of the company's current reporting challenges

and available data sources. In this thesis I focus only on direct procurement performance measurement in the case company.

The delimitation of the thesis defines what is excluded from the study. The research in this thesis does not cover the whole organization, as said it focuses only on this exact procurement team. Study is also only using one ERP system as the main data source for quantitative information, this means that other possible systems and external data sources are outside the scope. Indirect procurement activities are not focused in detail in this thesis. Some of the procurement performance dimensions remain outside the detailed analysis, because of practical limitations in data availability and project scope. Quality related metrics for example are only included to the extent that relevant and consistent ERP data is available.

1.5 Structure of the Thesis

The structure of the thesis is included in the five main chapters. Chapter one goes through the background of the study. It presents the case company briefly where this study will be conducted. Research objectives and the main research question are presented in this chapter. Also it defines the scope and delimitations of the thesis. In chapter two, the theoretical background of the study is presented. It reviews literature on performance measurement, procurement performance measurements, business intelligence and dashboards. It brings together these perspectives for identifying the research gap addressed in this thesis. The chapter two will establish the theoretical foundation for selecting relevant procurement KPIs and for designing the dashboard solution.

Chapter three describes the methodological framework of the thesis. It is consisted from explaining the research approach, data collection process and data analysis methods used in the study. The empirical results and the dashboard development process is presented in chapter four. First it describes the current reporting environment and the main findings related to procurement information needs in the case company. After that, it

presents the implications of these findings for KPI selection and dashboard design. This will be followed by the implementation and initial evaluation of the Power BI-based procurement performance dashboard. Conclusions of thesis are in the chapter five. It summarizes the key findings and discusses them in relation to the literature. Presents the theoretical and practical contributions of the study and evaluates the limitations of the research. This last chapter also provides suggestions for future research and further development of the dashboard solution.

2 Literature review

To be a able form the basis of the thesis theoretical and empirical literature needs to be done. This chapter reviews these to form the basis and it is done in three main parts. First, general performance measurement literature is discussed to clarify how performance measurement systems have evolved and what is expected from a well-designed se of measures. Then, purchasing and procurement performance measurement literature is examined to identify relevant procurement specific performance dimensions for a centralized procurement team. Last main part is about business intelligence, and dashboard research is reviewed to understand how procurement KPIs can be implemented in practice through a Power BI based solution. The chapter is closed with a synthesis and identification of the research gap that is thesis addresses.

2.1 Performance measurement

To manage company properly and in line with today's times, performance measurement is crucial, because it helps management to understand how well different parts, processes or individuals accomplish the goals that have been assigned to them (Neely, 2007). Performance measurement has been defined as a process of quantifying the efficiency and effectiveness of actions, and the associated performance measurement system as the set of metrics used to quantify both dimensions (Neely et al., 2005). State of the art reviews shot that performance measurement systems have evolved from simple collections of indicators towards more integrated systems that span the whole lifecycle from design to implementation, use and review (Nudurupati et al., 2010). These performance measurements are used to track past progress and to orient future improvement measures (Neely et al., 2005). With this help companies can recognize development targets, improve decision making and support strategy implementation on a practical level (Bourne et al., 2003). Neely et al. (2005) reminds by saying that it is still important to acknowledge that measuring by itself will not improve performance. Performance

measurements need to be appropriate, fit the context and be genuinely linked to decision making so that the information is actually used . The overall need to improve quality and service, while remaining committed to cost constraints has influenced the evolution of performance measurement in management (Amaratunga & Baldry, 2002). More recent literature also stresses that performance measurement and management systems are more and more used in data intensive, digital and industry 4.0 environments. This increases both the opportunities and the complexity of using performance information (Demartini & Taticchi, 2022). The must thing to remember when measuring is that we do not want to measure just for fun or just measure because it looks good. Measuring needs to go along with the company's strategy. That is how performance measuring helps the organization in long-term strategy.

Performance is often explained as the relationship between these two different dimensions, effectiveness and efficiency (Neely et al., 2005). Głodziński (2019) says, that effectiveness is the level of satisfaction when an action's outcomes satisfy the goal and efficiency is explained as an optimization, where the connection between outputs and inputs is utilized in delivering those outcomes (Głodziński, 2019). Neely et al. (2005) describes these two things in the same way as Głodziński, but more in economically sense. Like how economically organizations can use the resources to achieve their goals. Parkkinen (2020) talks about these two things in the context of procurement. She says that in procurement, effectiveness can be considered as an external measure, such as customer satisfaction and delivery reliability, while efficiency is related to internal resource use, such as cost levels and lead times (Parkkinen, 2020). To find a good balance between these two dimensions is central for an company's competitiveness (Neely, 2007). Reviews of performance measurement and management systems highlight that a well-designed performance measurement system should therefore include indicators that capture both efficiency and effectiveness, rather than focusing on one side only (Nudurupati et al., 2011).

Traditional measuring of performance is heavily criticized, because it focuses too much on financial key performance indicators and short-term achievements (Neely et al., 2005). Neely et al. (2005) define performance measurement as a process that quantifies the efficiency and effectiveness of operations. They also argue that financial controls alone do not do enough to guide operations for the long-term perspective. Bourne et al. (2003) sympathize that by saying margins, profit, and unit costs are these financial measurements and they are very central to measuring, but they measure mainly past performance and they can lead decision-making from a long-term to a short-term. Neely, (2007) in his book adheres to the importance of fulfilling the customer need and the economical use of resources, which is the main thing in performance measurement and what it should focus on. To this, Neely et al. (2005) suggest that the final dashboard of performance measurement should combine past success showing measurements and measurements which predicts future performance. Nudurupati et al. (2011) describe this shift as part of a broader performance measurement revolution, where organizations move from historical, accounting based metrics towards integrated systems with non-financial and forward-looking measures. Demartini & Taticchi (2022) say in their text that digital technologies and advanced analytics increase the possibilities for predictive indicators but at the same time require careful consideration of data quality.

Not only are individual measurements looked, but the entire performance measurement system and its connection to strategy are also examined. Neely et al. (2005) talks about a three-level analysis for a measurement system. The level of individual performance measurements, the level of a set of performance measures, and the relation between where the environment and the performance measurement operate. Figure one demonstrates this three-level examination of performance measurement. They emphasize this way that measurements should be aligned with the company's goals (Neely et al., 2005). Later studies similarly underline that performance measurement and management systems need explicit processes for updating measures when strategies, technologies or the external environment change so that the relevancy keeps over time (Nudurupati et al., 2011). Demartini & Taticchi (2022) add that this evolutionary view of performance

system management design and use is especially important in Industry 4.0 contexts, where new data sources and management theories continuously influence how performance should be measured and managed.

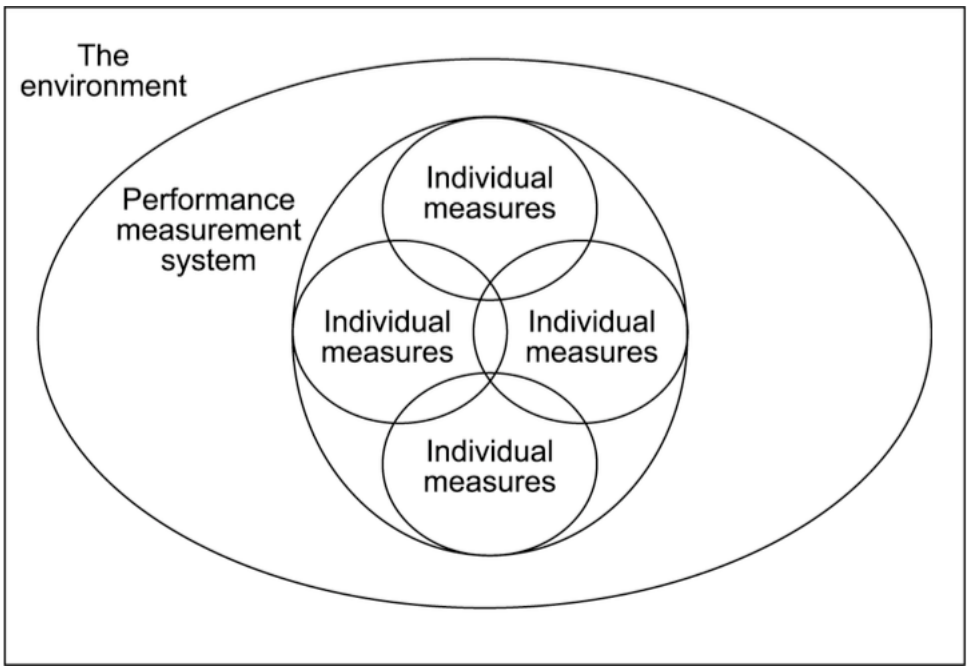

Figure 1. A framework for performance measurement system design (Neely et al., 2005).

A typical reason, which creates problems in measurement system implementation are the unclear measurement purposes and insufficient linking to the company strategy, according to Bourne et al. (2003). Parkkinen (2020) agrees with this in her work, but in the procurement context. She sums up that without a clearly defined measurement purpose and connection to the company's strategy, measurements are not implemented systematically as a part of decision-making. It is important to acknowledge that too many performance measurements make it difficult to manage the bigger picture and it weaknesses the usability of the performance measurement set (Neely et al., 2005).

2.2 Purchasing and procurement performance measurement

Performance measurement in purchasing cannot be considered in isolation. Rather, it is an important part of the purchasing management process and should be aligned with the organization's goals overall (Van Weele, 2018). In this thesis, the term procurement performance measurement refers to the systematic evaluation of the purchasing function's effectiveness and efficiency in the case company's centralized procurement team. The concept builds on Van Weele's (2018) definition of purchasing performance, which is the sum of purchasing efficiency, for example, the resources needed to accomplish those objectives, and purchasing effectiveness, for example, the degree to which purchasing objectives are fulfilled (Van Weele, 2018). Van Weele identifies five key areas for measuring purchasing performance: price and cost, product quality, logistics, supplier relationships and the purchasing organization and its resources, which together provide a comprehensive view of how purchasing contributes to company performance (Van Weele, 2018). Figure 2 illustrates these performance areas, their primary measurement aims and example indicators in more detail. In this thesis, these purchasing performance dimensions are applied to the broader procurement function and used as a basis for structuring the KPI categories implemented in the Power BI dashboard. In the context of a centralized procurement team, these dimensions become especially relevant. That is because like Waditwar (2023) explains the centralized procurement seeks to combine purchasing volumes, standardize processes and improve visibility across suppliers, contracts and spending. This increases the need for systematic and organization wide performance measurement (Waditwar, 2023).

Area	Measurement aimed at	Continuous/ incidental	Examples
Purchased materials prices and costs	Purchased materials cost control	C	Materials budgets, variance reports, price inflation, reports, purchasing turnover
	Purchased materials cost reduction	C	Purchasing cost saving and avoidances, impact on return and investment
Product/quality of purchased materials	Early purchasing involvement in design and development	I	Time spent by purchasing on design and engineering projects, initial sampling reject rate (%)
	Incoming inspection quality control and assurance	C	Reject rate (%), line reject rate (%), quality costs per supplier
Purchasing logistics and supply	Monitoring requisitioning	C	Purchasing administrative lead-times, order backlog (per buyer)
Supplier relationships	Delivery reliability (quality and quantity)	C	Rush orders, delivery reliability index per supplier, materials shortages, inventory turnover ratio, JIT deliveries
	Supplier operational performance	C	Supplier quality cost, supplier reject rate, OTIF (On Time in Full) score
	Supplier relationship	I	Supplier satisfaction score
Purchasing staff and organization	Training and motivation of purchasing staff	I	Time and workload analysis of purchasing department, purchasing budget, purchasing and supply audit
	Purchasing management quality	I	
	Purchasing systems and procedures	I	
	Information systems	I	

Figure 2. Examples of purchasing performance indicators (Weele, 2018).

The principles of general performance measurement are applied to the context of procurement, so that efficiency and effectiveness are concretized in, for example, costs, delivery capacity, quality and supplier cooperation (Neely et al., 2005). As summarized in Figure 2, Van Weele's (2018) purchasing performance areas cover these dimensions through concrete metrics that can be followed by continuously or on an incidental basis (Van Weele, 2018). These can be used to measure how well procurement supports the company's goals in terms of, for example, cost efficiency, delivery reliability, innovation capacity and risk management (Van Weele, 2018). In a centralized procurement model this kind of measurement also supports the consolidation of demand, the reduction of duplicated work and the creation of a single source of truth for procurement related data. All this will strengthen the strategic role of procurement in the organization (Waditwar,

2023). In this way, the idea of balanced performance measurement presented in Chapter 2.1 is specified in procurement as concrete KPI areas that guide both operational activities and strategic decisions (Neely, 2007). In addition, Waditwar (2023) argues that centralized procurement makes process efficiency, compliance and risk control better, which suggests that procurement performance measurement should not only focus on savings and prices, but also on process standardization, supplier visibility and data-driven decision making.

Empirical studies support the view that measuring procurement performance is linked to a company's financial performance. Saranga and Moser (2010) assess procurement and supply chain performance using a two-stage value chain DEA model and show that PSM drivers and PSM performance outcomes have a measurable link to companies' EBITDA margins (Saranga & Moser, 2010). Schiele (2007) examines the relationship between procurement maturity and cost savings and finds that mature, systematic procurement practices are associated with better savings outcomes and procurement performance (Schiele, 2007). In their systematic literature review, Georgino et al. (2021) compiles the procurement process components and practices that are linked to financial performance measures, such as profitability and return on capital (Georgino et al., 2021). These results support that the procurement metrics are not just a reporting tool, but a key tool in demonstrating and developing the effectiveness of procurement. This perspective goes along with Waditwar (2023) view on that centralized procurement can transform procurement from a fragmented and transactional function into a more strategic and value creating organizational capability.

Practical case studies illustrate that without a clearly defined and up-to-date procurement metrics, the control and development of procurement activities can easily fall short. Parkkinen (2020) describes how the case company's procurement metrics were outdated and the information they produced was considered unreliable, as a result of which the metrics were hardly used in decision-making (Parkkinen, 2020). Similarly, Helala (2022) and Penttinen (2021) show that renewing the procurement metrics and, for

example, KPI frameworks based on a balanced scorecard can help link the financial, process and stakeholder perspectives of procurement to the company's strategy and improve the usability of measurement data. This highlights the need to develop procurement performance measurement not only from the perspective of metric selection but also from the perspective of reporting and practical utilization. This kind of need is emphasized in centralized procurement environments, where fragmented data, inconsistent practices and limited visibility can weaken control unless procurement information Is brought together into common structures and monitored systematically (Waditwar, 2023).

Since a single set of metrics is not necessarily enough without a functional reporting and analytics solution, the next subsection examines how business intelligence and dashboards can support procurement performance monitoring and decision making.

2.3 Business intelligence and dashboards

Business intelligence (BI) refers to the processes and technologies by which an organization collects, combines, analyzes, and refines internal and external data to support management decision making (Pirttimäki, 2007). Business intelligence refers to the processes and technologies by which an organization collects, combines, analyzes, and refines internal and external data to support management decision making (Heang & Mohan, 2016). According to Pirttimäki (2007), the core of BI is in identifying information needs and in transforming raw data into information and expertise that can be utilized in decision-making through a consistent process (Pirttimäki, 2007). When examining BI architecture, Heang and Mohan (2017) emphasize the entity formed by the data and integration layer, data warehouses, and analytics layer, where success requires both technical capabilities which are data quality, integration, user access and organizational capabilities, such as flexibility and risk management support (Heang & Mohan, 2017). Recent work on Power BI in procurement further illustrates how BI tools can integrate data from multiple sources, apply data-cleaning techniques and provide interactive visualizations

for spend analysis and supplier performance evaluation (Naikwadi & Shende, 2025). Saidur (2025) take this further and describes BI architectures as extending this layered structure with advanced analytics components. These components are different machine learning models and intelligent alerting mechanisms, so that dashboards can deliver not only static reports but also automatically generated insights and anomaly signals.

Dashboards form the central user interface of a BI solution for performance management. Yigitbasioglu and Velcu (2012) define a dashboard as a data-driven decision support system that aggregates and visualizes key metrics in a single view and enables drilling down into the underlying data (Yigitbasioglu & Velcu, 2012). According to their literature review, the benefits of dashboards include reducing information overload, leveraging human visual perception, and the ability to link metrics to, for example, strategy maps, allowing users to see their role in relation to the company's goals (Yigitbasioglu & Velcu, 2012). Building on this, more recent dashboard research stresses that in addition to visual layout and cognitive fit, interaction design and the way algorithmic or AI-generated signals are embedded in the interface, they are crucial determinants of dashboard effectiveness. Especially when users are expected to act on automated insights (Saidur, 2025). However, they caution that poorly designed dashboards or continuous performance monitoring can lead to unintended behavioral effects, which highlights the importance of careful, purposeful design (Yigitbasioglu & Velcu, 2012). Naikwadi and Shende (2025) similarly emphasize that while Power BI dashboards can provide real-time spend visibility and automated reporting, their value depends on appropriate design choices and user-centric implementation (Naikwadi & Shende, 2025).

Empirical case studies show that BI solutions and dashboards can support the day-to-day operational management of procurement and supply chains. Tolvanen (2019) developed a business intelligence solution using Microsoft Power BI to monitor and analyze the procurement processes and supply chain of an engineering company, combining data from multiple source systems into a single data model (Tolvanen, 2019). The case

study highlights that the perceived value of a BI solution depends not only on the views and metrics provided, but also on technical performance, such as loading times and ease of use, which affect the implementation and wider use of the solution (Tolvanen, 2019). Halonen (2023), in turn, examines the use of data analytics in procurement and highlights that the effective use of analytics and BI tools requires the systematic development of data quality and data management, as well as linking analytics capabilities to strategic procurement and business goals. In line with these findings, research on AI enhanced dashboards underlines that advanced analytics, such as predictive models or anomaly detection algorithms can only provide meaningful support for operational management, when they are built on reliable data and designed in ways that procurement professionals trust and understand (Saidur, 2025). In addition, Naikwadi and Shende (2025) show that Power BI–based procurement dashboards can enhance spend transparency, support supplier performance evaluation and enable anomaly detection in procurement data, but also point out challenges related to data integration, user adoption and data security (Naikwadi & Shende, 2025).

From a procurement perspective, BI and dashboards provide a practical tool to bring the procurement performance metrics described in Chapter 2.2 into operational and tactical decision-making. The results of Tolvanen (2019) and Halonen (2023) show that when procurement and supply chain data are combined in a BI solution and visualized with dashboards, decision-makers get an up-to-date view of, for example, costs, delivery capacity and supplier performance, which supports both daily guidance and the longer-term development of procurement (Tolvanen, 2019). The results of Tolvanen (2019) and Halonen (2023) show that when procurement and supply chain data are combined in a BI solution and visualized with dashboards, decision-makers get an up-to-date view of, for example, costs, delivery capacity and supplier performance, which supports both daily guidance and the longer-term development of procurement (Halonen, 2023). Findings from Naikwadi and Shende (2025) complement this view by demonstrating that Power BI dashboards can be used to analyze procurement spending patterns, identify cost-saving opportunities and evaluate supplier performance through interactive

visualizations (Naikwadi & Shende, 2025). Against this background, studies on AI enhanced business intelligence dashboards suggest that procurement dashboards are gradually evolving from tools that mainly describe past performance towards solutions that can also indicate emerging risks and opportunities. Highlighting unusual spend patterns or changes in supplier reliability that would that would be difficult to detect manually are good example of this (Saidur, 2025). This development is relevant for centralized procurement teams, where a large volume of data and multiple supplier relationships make automated pattern detection and prioritization potentially valuable.

Once the procurement performance metrics have been defined, it is natural to move on to examining how the metrics are put into practice through a BI solution and dashboards, so that the data is refined into information that supports decision-making. The task of the BI architecture is to combine procurement data from different source systems into a single information model, on which interactive reports and dashboards can be built; dashboards serve as a user interface, where the KPI categories presented in Chapter 2.2 are visualized for users in an easily interpretable format (Yigitbasioglu & Velcu, 2012). The task of the BI architecture is to combine procurement data from different source systems into a single information model, on which interactive reports and dashboards can be built; dashboards serve as a user interface, where the KPI categories presented in Chapter 2.2 are visualized for users in an easily interpretable format (Heang & Mohan, 2017). The Power BI-based procurement performance dashboard developed in this work concretizes these principles in the everyday life of the case company's centralized procurement team, as it compiles procurement data from different sources, calculates the values of the selected KPI metrics, and presents them in a unified view that supports procurement decision-making (Tolvanen, 2019). The Power BI-based procurement performance dashboard developed in this work concretizes these principles in the everyday life of the case company's centralized procurement team, as it compiles procurement data from different sources, calculates the values of the selected KPI metrics, and presents them in a unified view that supports procurement decision-making (Halonen, 2023). At the same time, the emerging AI enhanced dashboard literature indicates that

such a solution can also serve as a platform for future development, where features like automated anomaly detection or simple predictive indicators could be integrated in a stepwise manner as the company's data maturity and information needs evolve (Saidur, 2025).

2.4 Synthesis and research gap

The literature presented in previous parts of this chapter shows that performance measurement has evolved from traditional financial metrics towards more balanced, strategy-linked approaches. General performance measurement literature emphasizes alignment of metrics with organizational strategy, including integration of financial and non-financial dimensions and be developed as part of a broader measurement system rather than as isolated indicators (Neely et al., 2005; Neely, 2007). At the same time these frameworks are normally discussed at general organizational level and they do not give a precise understanding of how such principles should be translated into procurement specific BI and dashboard solutions.

The procurement literature, in turn, provides both theoretical frameworks and empirical evidence for measuring procurement performance. Van Weele (2018) provides a structured view of purchasing performance through the dimensions of price and cost, quality, logistics, supplier relationships, and the purchasing organization itself. Empirical studies further show that procurement performance is linked to broader business outcomes. Example of this is in Saranga & Moser (2010) study, where they demonstrate a measurable relationship between purchasing and supply management performance and firms EBITDA margins. Schiele (2007) on the other hand shows that higher procurement maturity is associated with better cost savings outcomes. Adding to these (Georgino et al., 2021) in their more recent study identify procurement practices that are associated with financial performance measures such as profitability and return on capital. Together these studies supports the view on how procurement metrics are not only operational

reporting tools but are also linked to the strategic and financial performance of the company.

Other theses focusing more directly on procurement measurement development also show that procurement metrics and KPI frameworks often require updating in order to keep up with the changing strategic role of procurement. Parkkinen (2020) shows that outdated and unreliable procurement metrics can reduce the practical use of measurement in decision making. Helala (2022) and Penttinen (2021) also highlights that procurement measurement frameworks should be linked to company strategy and should cover these important dimensions like finance and process. Lennartz (2024) thesis also points toward the continuing need to refine procurement metrics in relation to current organizational needs. These researches tends to focus either on the content of procurement metrics or on organization specific development processes, rather than where my thesis will focus, which is on how those metrics are embedded into a practical BI solution for everyday managerial use.

The business intelligence and dashboard literature complements this discussion by explaining how data can be transformed into actionable information for decision making. Pirttimäki (2007) describes BI as a process driven by decision makers information needs, where data is handled into usable knowledge. Heang and Mohan (2017) takes this further and highlights the importance of data quality, integration and user access as key BI capabilities. Dashboards are defined as data-driven decision support tools that aggregate and visualize key metrics in single view and enable drill-down into underlying data (Yigitbasioglu and Velcu, 2012). Case studies focusing on procurement and supply chain show that Power BI-based solutions can improve transparency and support daily operational management (Tolvanen, 2019). In addition, recent work on procurement spend analysis with Power BI points out that there is benefits in cost visibility and supplier performance evaluation (Naikwadi & Shende, 2025).

On this basis, a research gap emerges at the intersection of procurement performance measurement, centralized procurement and BI-enabled dashboard solutions. Prior literature shows that moving from fragmented purchasing to centralized procurement increases the need for integrated and transparent procurement information (Waditwar, 2023). So there is limited empirical research on how a procurement KPI framework based on established performance domains can be operationalized into a Power BI dashboard that supports the practical information needs of a centralized procurement team in a project-based industrial context. This thesis addresses this gap by developing and evaluating the Power BI-based procurement performance dashboard for a centralized procurement team in a case company, combining general performance measurement theories like Neely et al., (2005) has. Procurement performance frameworks like Van Weele (2018) demonstrates and opens up Waditwar (2023) centralization literature and BI/dashboard research into a single design-oriented case study like (Yigitbasioglu & Velcu, 2012).

3 Method

This chapter describes the methodological choices of this thesis and explains how the study was carried out in practice. The chapter has three parts. The first part presents the research approach and justifies the use of Design Science Research Methodology (DSRM) embedded in the context of a single case company. The second part describes the data collection, which is based on semi-structured interviews and ERP data from the company's IFS system. The third part explains how the data were analyzed and how the dashboard development process was outlined, including the selection of KPIs, the use of the data warehouse based Power BI model and the initial evaluation of the artefact as part of the study design.

3.1 Research approach

The thesis follows the DSRM, because the main objective is to design and evaluate an IT artefact, which is in this study a Power BI based procurement performance dashboard. The missing of this kind performance measurement tool addresses a concrete problem in the case company. Design science focuses on creating artefacts such as models, methods or systems that improve organizational performance and are grounded in both theory and the problem context (Hevner et al., 2004). In this study, the artefact is intended to support procurement performance monitoring and decision making in a newly centralized procurement team. The research process is structured according to the six DSRM activities, which are identifying and motivating the problem, defining the objectives of a solution, designing and developing the artefact, demonstrating the artefact, evaluating the artefact and lastly communicating the results (Peffers et al., 2007).

In this thesis, the problem and solution objectives are defined based on the literature review and initial discussions with the company, the dashboard is designed and implemented in Power BI using ERP data, and the first version is demonstrated and discussed

with key stakeholders in the procurement team. The evaluation focuses on an initial, qualitative assessment of how well the dashboard reflects the identified information needs, while more extensive, long-term evaluation and further development are outlined as future work. The thesis document itself constitutes the main communication of the results. The design work is carried out in the real-life context of one Finnish industrial company and its centralized procurement function. In this sense, the research can also be described as a design science study embedded in a single-case setting (Yin, 2018), but case study here mainly describes the context and multiple data sources rather than a separate methodological strategy.

3.2 Data collection

The data for the thesis were collected from two main sources, semi-structured interviews and ERP data from the IFS system. These sources complement each other: interviews provide stakeholder views on procurement information needs, while ERP data provide the numerical basis for KPI calculation and dashboard construction. Using more than one source of evidence strengthens the analysis and supports triangulation in a case-based design science study (Yin, 2018).

Semi-structured interviews were used to gather qualitative information from the procurement team of the company. The interviews focused on the current state of procurement performance measurement, the challenges related to reporting and the information needs that the dashboard should address. All the interviews had preplanned structure to make sure that all the important topics were covered and examined. To make sure that interviews go smoothly, questions were handed to interviewees before the interview and that interviewees are able to prepare themselves for the interview. Interviews were also conducted virtually or face to face, but via Microsoft Teams and they were recorded with the participants approval. This because the platform’s automatic transcription feature was utilized for the initial transcription of the interviews.

Interview	Interview date	Interviewee position	Language	Duration
1	24.3.2026	Purchaser 1	Finnish	50 min
2	24.3.2026	Senior Purchaser 2	Finnish	54 min
3	25.3.2026	Supply Chain Engineer 1	Finnish	31 min
4	25.3.2026	Category Manager 1	Finnish	40 min
5	26.3.2026	Purchaser 3	Finnish	52 min
6	26.3.2026	Category manager 2	Finnish	42 min
7	26.3.2026	Purchaser 4	Finnish	32 min
8	27.3.2026	Supply Chain Engineer 2	Finnish	51 min
9	27.3.2026	Director, Sourcing	Finnish	49 min

Table 1. Interview participants

The quantitative data were retrieved from the company's ERP system, which is the IFS. This data formed the numerical basis for the procurement KPI's visualized in Power BI and made it possible to calculate the selected indicators consistently from source data. Because of the dashboard intension to support operational and managerial decision-making with actual company data rather than with hypothetical examples, the ERP data is valid for this type of study.

3.3 Data analysis

For the collected data, I used thematic analysis to analyse the qualitative interview data. This approach is methodical, but also gives flexibility for identifying and interpreting patterns in qualitative data (Nowell et al., 2017). The leverage to use thematic analysis in this work was the flexibility, as said earlier. Also, because the purpose of the interviews was to reveal recurring information needs, challenges and expectations regarding this work targeted team, rather than to develop a formal theory. The analysis was deductive,

because it was primarily theory- and research question-driven, as the semi-structured interview guide and the initial coding frame were based on the literature review and the research objective. Although inductive elements was also part of the analysis, so the new unanticipated issues emerging from the interviews could be incorporated into the themes.

The analysis followed the six-phase process described by Braun and Clarke and these phases are familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report (Nowell et al., 2017). After each interview, the transcript was checked and anonymized so that participants are referred to only by their role. The anonymized transcripts were then coded, and the codes were grouped into broader themes that describe, for example, data availability, workload visibility, supplier performance and usability of reports. These themes form the basis for the empirical findings and for the design requirements of the dashboard presented in chapter 4. In this thesis, after each interview, the Microsoft Teams recording and automatic transcript were checked and little bit edited to correct obvious transcription errors. These transcripts was anonymized so that participants are referred to only by their role, which was decided to do for protect confidentiality. This way still allows to compare the roles.

The ERP data were used to operationalize and test the KPIs in the dashboard. With the help of company's IT support integration of relevant procurement data from the IFS system into a data warehouse and provided a live connection to this warehouse as a Power BI semantic model was done. In this study, additional tables and fields needed for procurement performance measurement were added to this existing model, after which the indicators identified in the literature review and thematic analysis were implemented directly on top of the live data model without separate offline data cleaning. The resulting KPI values and visualizations were then checked for plausibility through descriptive analysis and visual inspection in Power BI. This quantitative work is closely linked to the

design science process, because each iteration of KPI definition and visualization informed the refinement of the dashboard artefact.

4 Results

Chapter four presents the empirical results of the study and the development of the Power BI based procurement performance dashboard in the case company. The empirical setting and interview material is discussed and presented first, then the interview findings are summarized through four main themes that characterize the procurement team's information needs. Last part is about the implications of these themes for KPI selection and the dashboard view structure are presented one by one.

4.1 Empirical study setting

So, in this section the empirical setting and describes the interview material on which the findings are based. The introduction of the case company and its procurement team were made in chapter one and therefore the purpose of this chapter is not to repeat the company background but to define the setting of the empirical investigation and the material on which the findings are based on. Focus on this empirical analysis is on the centralized procurement team and on the information needs related to procurement performance measurement and dashboard use in combining shared role specific and cross role pages. As shown in chapter three table 1. The empirical material includes nine semi-structured interviews and these are conducted with members of the centralized procurement team. There is four different role groups which are represented in the interviews, buyers, supply chain engineers, category managers and the procurement director.

4.1.1 Empirical material and interviewed roles

Procurement team roles reflects well the operational, tactical and managerial dimensions of procurement work in the case company so the empirical material was collected

from them. Four of the interviewees works under role buyer, two as a supply chain engineer, two as a category manager and one as a procurement director. This role structure made it possible to examine dashboard related information needs from several perspectives within the same procurement function. Ranging from day-to-day order handling to category-level development and procurement leadership gives good perspective. The interviews followed the same general structure, but there was slight diffractions in the interview questions for adapting discussion to each role good. So, in all interviews, the participants were asked basic question, describing their role and daily work, the metrics or other follow-up practices currently used, the kinds of information they considered important, and the features they would expect from an easy-to-use dashboard. Appendix 1 shows all the interview questions. Because the aim of the study was to support dashboard design, the material was collected specifically from those roles that are excepted to use procurement performance information in operational work, supplier and category management or in managerial decision-making.

4.1.2 Existing measurement and reporting environment

Currently in the case company, the procurement performance measurement is based on a combination of ERP data, manually maintained Excel files and selected Power BI reporting views. This was also the situation at the time when the interviews were taking part of. Because financial department in the case company uses Power BI reporting view for overview, some category-level spend information was available through there. Otherwise, for example, on-time delivery was followed through an Excel-based report compiled from ERP data. This means that the empirical setting of the study was not a situation in which performance measurement was entirely absent. Rather, the case company already had certain reporting practices and data sources in place, but these had developed for different purposes and at different times. For this reason, the empirical part of the study does not begin from a blank slate, but from an existing measurement environment in which dashboards, spreadsheets and ERP-based reports already coexist.

Against this background, the purpose of the interview analysis was to identify recurring patterns in how different procurement roles describe their information needs in relation to this existing reporting environment. The next chapter presents the results of the thematic analysis through four main themes that emerged from the interview material.

4.2 Interview findings and thematic analysis of information needs

In this section the main themes of the interviews with buyers, supply chain engineers, category managers and the procurement director is presented. These themes were found using six step thematic analysis and summarizing recurring patterns in how different roles described their work practices, existing problems in measuring and expectations for a Power BI solution. The accomplished four themes, data availability and reliability, workload visibility and operational follow-up, supplier performance and spend for decision making, and lastly usability and integration into daily work reflects both classical dimensions of performance measurement and procurement specific needs identified in the literature.

4.2.1 Data availability and reliability

At the start interviewees across the roles described significant challenges in accessing reliable, up-to-date data for following procurement practices. Buyers and supply chain engineers noted that basic operational information, such as on-time delivery, late and unconfirmed orders and their own purchase portfolio is scattered across several systems and email channels. This is found a challenge that forces them to rely on manual checks and personal lists, which leads different ways to handle data and get results. Category managers and the procurement director reported that while some high-level spend views and manually built OTD reports exist, they do not provide a consistent, fact-based overview of what is happening in each category or project.

All the buyers pointed out the main concerns to OTD and order status data. For OTD measuring buyers are more or less utilized OTD Excel, but they described it as slow to open, containing large amounts of data and being difficult to read, and couple interviewees stated that they are unsure how the measure is calculated and whether it can be trusted. Basically, the late and unconfirmed orders are often identified by manually scanning order lines in the ERP and by monitoring shared and personal mailboxes, which is found time consuming and reactive. Supply chain engineers face similar issues, for example, they raised concerns about not having formal indicators for delivery reliability or reclamations and the fact that shortcomings in warehouse receiving data can systematically distort OTD figures used in supplier discussions.

At the category and leadership levels, the data challenges are more related to spend visibility, item structures and the completeness of ordering data. Both category managers emphasized that they cannot reliably say what is happening in their categories right now, because all of the orders which are related to their category are not processed through the ERP system and the existing item structures do not support product group level analysis. This indeed makes category-level spend and savings tracking very difficult. As of right now, the procurement director compiles the OTD Excel and the other key figures manually on a monthly basis and these are recognized mainly as a reporting tool rather than as a basis for continuous steering. Director notes that he lacks an end-to-end view of how well the supply chain meets need dates, keeps confirmations and performs against budgets and contracts. These findings indicate that improving data availability and reliability is a main goal for any meaningful performance measurement in the case company, from daily operational follow-up to category management and procurement leadership.

4.2.2 Workload visibility and operational follow-up

When the interviewees were asked about current workload or about the day-to-day work interviewees reported limited visibility into their own and the teams workload and

into which orders or tasks require immediate action. Purchaser 1 described at the time day-to-day work as “putting out fires at the moment”, where purchase requests and order related issues arrive via multiple channels and are handled one by one, with only a weak overview of the total amount and urgency of open work. In the absence of a consolidated view, they monitor late and unconfirmed orders by scrolling through ERP order lists, order acknowledgements and compiling ad-hoc lists via shared and personal email inboxes, which is perceived as reactive and inefficient way of doing these.

Supply chain engineers highlighted similar challenges, but from a process and capacity perspective. One of the supply chain engineer uses the number of “to be ordered” lines in the MRP as a rough indicator of workload and supplements this with handwritten notes on ongoing orders and savings to keep track of what needs attention. Other supplier chain engineer emphasized the need to understand not only how many tasks are in the process, but also how long they take and how loaded the team is at any given time, arguing that without clear indicators for process lead time and workload it is difficult to explain why some work is waiting or to justify that the team is already operating at, for example, “one hundred and ten percent” capacity. Both engineers underlined that improved visibility should cover the full flow from request to order and include internal steps such as specification, approval and receiving, as delays in these stages directly affect delivery performance but are not currently tracked.

Category managers and the procurement director viewed workload and operational follow-up through the lens of project risk and process performance. One category manager stressed that on-time delivery should be seen as a critical project risk indicator rather than only as a supplier metric and called for a simple dashboard showing, in one view, which orders and delays require intervention, for example using color coding and the ability to drill down to purchase order line level. Director focuses on workload through regular discussions and reviews. He conducts one-to-one meetings and team workload reviews approximately twice a month and expressed interest in measuring the request-to-order process, particularly the response time to ad-hoc needs, as well as

changes in the quality of the order backlog such as the reduction of zero-price orders and invoice corrections over time. These perspectives suggest that better workload visibility and operational follow-up are needed both to support daily prioritization at the buyer and engineer level and to monitor process performance and project risk at category and leadership levels.

4.2.3 Supplier performance and spend for decision-making

Supplier performance and spend emerged as a central theme for all interviewees, but with role specific emphases ranging from operational OTD and complaints to category level cost trends and strategic savings and compliance. Buyers primarily focused on having basic supplier level metrics such as on-time delivery and, where possible, complaints data to support operative decisions and supplier meetings. Several buyers described situations where they would like to enter a supplier into a dashboard and immediately see that supplier's OTD trend, the number of late or unconfirmed orders and, in the future, key quality issues, in order to move beyond anecdotal experiences in discussions. However, current limitations in OTD tracking and complaints logging mean that this type of consolidated view is not yet available.

Supply chain engineers extended the supplier performance discussion from basic OTD and quality to include project-level cost feedback and the role of internal processes. One of the supply chain engineer identified OTD, a systematic complaints metric and end-of-project cost comparisons between budgeted and actual material costs and work hours as his three most important metrics, arguing that such end-of-project cost would provide valuable learning for both supply chain engineering and the wider project organization. Also, one supply chain engineer stressed that logistics and warehouse performance are integral parts of supplier performance, because delays in receiving or undetected defective items in stock can distort OTD measures used in supplier negotiations. He also pointed out that the cost of white-collar work such as creating orders, correcting

poor orders and handling related errors, is typically invisible in current metrics, even though it is directly linked to the way supplier and process performance are managed.

Category managers and the procurement director approached supplier performance and spend mainly from category and project perspectives. Category manager 1 named spend development, on-time delivery and quality or complaints as the three most important metrics for category management, with additional value coming from tracking cost and price development per product group and monitoring supplier risk through financial indicators or early warning signals. Category manager 2 bring up cost level and price comparability, particularly in relation to raw material price changes such as copper, and described OTD as a key indicator of project risk, noting that the main challenges lie in the "quality" of the supply chain in terms of keeping promised delivery times rather than in the intrinsic quality of the products themselves. At the leadership level, director highlighted cost performance in the form of purchase price variance and savings, especially "savings to the bottom line" measured as project budget versus actuals and the remaining material budget per project. He also called for compliance metrics showing how much spend is under contract, as well as visibility into the contract base and its alignment with sales contracts. Together, these views indicate a need for supplier performance and spend metrics that link operational delivery and quality, category level cost and risk and project level budget adherence into a coherent measurement framework that can be used in supplier meetings, category work and management discussions.

4.2.4 Usability and integration into daily work

A consistent message across all interviews was that performance metrics and dashboards will only be used if they are easy to access, automatically updated and clearly integrated into everyday work and leadership routines. Buyers expressed a strong preference for a simple, visual "buyer's desktop" view that opens quickly, aggregates the most important indicators and allows them to drill down to the underlying order lines with one or two clicks. They described, for example, wanting a dashboard that shows

late and unconfirmed orders using a traffic-light logic and enables direct navigation from a red bar to the specific orders behind it, instead of having to run separate queries in the ERP and manually filter lists. Several buyers also underlined that they do not want to maintain separate Excel files or manually update reports, but would rather use dashboards that are populated automatically from the ERP.

Supply chain engineers emphasized similar principles but with a stronger focus on automation and process-oriented views. Supply chain engineer 2 stated that useful metrics should be available “at the push of a button” and should update automatically in the background, without requiring him to collect or enter data manually. He also suggested that existing ERP fields and remarks, such as additional information on orders, should be used to enrich metric views so that contextual information appears without additional effort. Supply chain engineer 1 highlighted the importance of a clear base report with the option to drill down, noting that, in his view, the best solution would be to see key metrics directly in the ERP, but that a BI-based dashboard is also acceptable if it is fast, automatically refreshed and allows easy filtering. He also raised concerns about excessively granular individual level metrics that could create unhealthy competition or demotivate employees and therefore favored team level statistics and averages.

For category managers and the procurement director, usability and integration are closely tied to supporting supplier meetings, category work and management reporting without creating additional manual workload. Category manager 1 described an ideal solution as a Power BI-type dashboard with one main view for core metrics and the ability to drill down to details, including multi-year trends for spend, OTD and complaints, which can be opened directly in supplier meetings without needing separate Excel manipulations or slide decks. Category manager 2 similarly asked for a single, straightforward dashboard with color coded signals showing which orders and delays require attention, built on purchase order line data so that he can move from a high-level view to concrete actions. Director emphasized dynamic, interactive metrics that can be integrated into his own “workspace”, with quick filtering by category, supplier, strategic

supplier or responsible person and automatic generation of management reports that still allow drilling down into exceptions. He also pointed out that the culture and expectations around metrics matter “if a measure is defined as important and embedded into regular leadership processes, it is more likely to be used in practice.” Overall, these findings suggest that the success of a new dashboard in the case company depends not only on what is measured, but equally on how seamlessly the solution fits into existing tools and routines and how little manual effort it requires from users.

4.3 Implications for the Power BI dashboard design

The thematic analysis of interview data highlighted several recurring information needs that have direct implications for the design of the Power BI dashboard. Findings from the analysis emphasized the importance of consolidating data from a single reliable source, improving visibility into open work and late orders, combining supplier performance and spend information and providing easy to use visualizations that can be integrated into day-to-day procurement work. This section describes how these implications have been translated into the first version of the procurement performance Power BI dashboard. For confidentiality reasons, the example views of pages, which are presented in subsections 4.3.2.1 and onwards show only the structure, KPI titles and visual types without actual numeric values. Supplier names and other sensitive details have been removed or anonymised from bar and pie charts and other visuals that originally contain company specific information.

4.3.1 Implications for the Power BI dashboard design

The design of the Power BI dashboard was created based on the four themes identified in the interview analysis. These themes were data availability and reliability, workload visibility and operational follow-up, supplier performance and spend for decision-making, and usability and integration into daily work. As I said in chapter 3.2, the quantitative

data was retrieved from the company's ERP system. So all measures in the dashboard are calculated from there in order to reduce reliance on separate Excel files and fragmented reports that were perceived as difficult to use and potentially unreliable. Related to second theme the dashboard should provide clear visibility into open work and exceptions, especially late and unconfirmed orders. This demand was important especially to buyers but of course for other roles so they can priorities their daily tasks more systematically instead of relying on manual searches in ERP system and ad hoc lists. The solution was intended to combine supplier performance and spend information, which occurred in theme three in a way that it supports both operational and category level decision making. This means that order volumes, values and on-time delivery are brought together in visualizations, with the possibility to filter and drill down by supplier, category, project or responsible person as needed. Relation to final theme founded from interview analysis the dashboard was designed to be easy to use and integrated into existing work routines. Visual elements such as KPI cards and time-series charts are used to give a quick overviews, while drill down tables allow users to access individual purchase order lines without exporting data to Excel.

To operationalize these principles, the dashboard has been structured into a hybrid of shared, role specific and cross role views. This first version of Power BI dashboard implementation focuses on an overview page that aggregates key procurement indicators for all users, complemented by three role tailored pages for the procurement director, buyers and category managers. Last page is a cross-role supplier page that supports supplier specific performance analysis and discussions. Important to say that all these pages are open for every role on the team to use, but this is the thinking behind the first version of this Power BI dashboard.

4.3.2 View structure and example visualizations

As described above, the first version of the Power BI dashboard was structured as a hybrid of shared, role-specific and cross-role views. The dashboard consists of an overview

page and a supplier page that are relevant to all users, complemented by three role-tailored pages for the procurement director, buyers and category managers. All pages use the same ERP-based data model and shared filters, but they differ in how the data is aggregated and presented for different decision making needs. The overview page provides a high-level picture of procurement activity that is relevant to all users, while the supplier page offers a more detailed view for analyzing a selected supplier across multiple indicators. The role specific pages focus on the particular information needs identified for buyers, category managers and the procurement director.

In the following subsections each view is described using a similar structure. First the purpose of the page and its intended user role are outlined. Second the main KPI indicators and visualizations on the page are presented. This includes how they summarize or aggregate the underlying ERP data. Third element is the explanation of how the view is intended to support the daily work or managerial decision making of the targeted role and how it connects to the overall dashboard concept.

4.3.2.1 Overview page

The idea of overview page was to aggregate key procurement indicators into a single view intended as a common starting point for all users of the dashboard. This was discussed with the procurement director, and we found it very relevant to be the starting point. Figure 3 is a capture from Power BI dashboard, where at the top of the page, four KPI cards are displayed without the values. Rolling 12-month figures for the number of purchase order lines (Order Lines, R12), the number of purchase orders (Orders R12), the total order amount in euros (Order Amount R12) and the average order line value (Order Line Avg R12). With these KPI card visuals, it gives immediate high-level view of how much is being purchased, how fragmented the orders are and what the typical transaction size is.

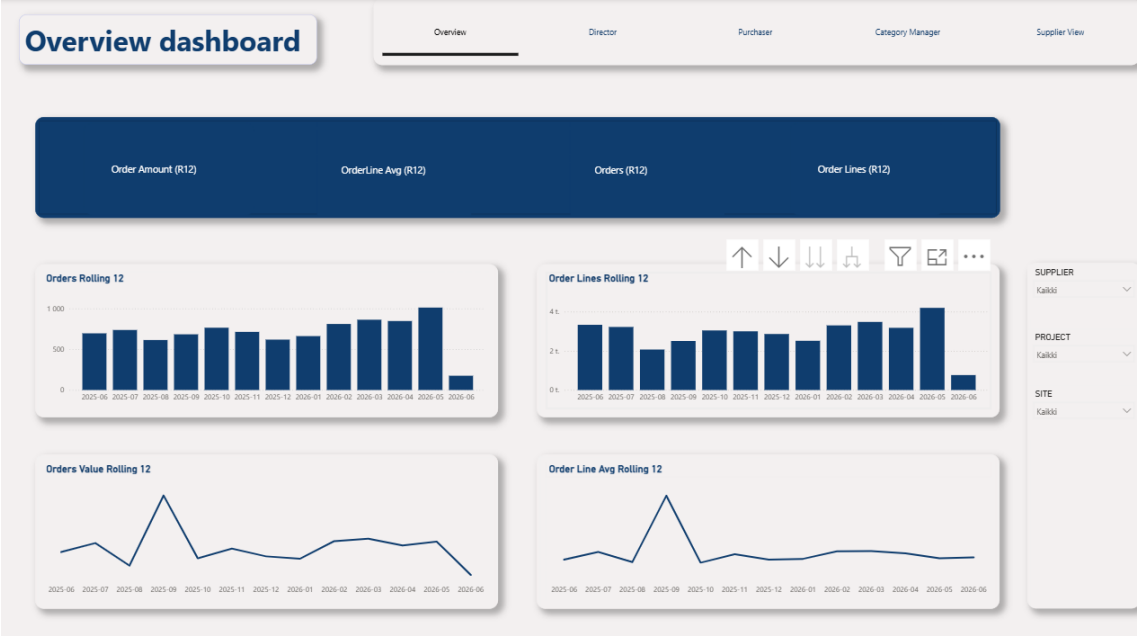

Figure 3. The overview page in Power BI dashboard

Under the KPI card visuals, the overview page includes a set of time-series charts. These charts show how procurement activity has developed over time. Separate line or column charts present the number of orders per month, the number of order lines per month, the monthly order value in euros and the evolution of the average order line value. These visuals make it possible to identify trends and habits such as seasonal peaks in order volumes, changes in the distribution of order lines and shifts in average line value, which relates directly to the interviewee's descriptions of fluctuating workload and project-driven purchasing.

4.3.2.2 Director page

The director view was designed to support the information needs of procurement management by providing a high level of procurement performance in one page with possibility to drill through certain things. Visualizations in this page tries to give much needed information about a managerial perspective. Figure 4 below show the structure of director view and what visualizations was used in it.

Figure 4. Director view

At the top of this page, the view includes KPI cards that summarize the most central indicators for management follow-up. These KPIs are total spend, On-time delivery percentage, spend change percentage in year over year comparison and the number of late order lines. These KPI cards together pictures clear and straight forward overview of procurement volume, delivery performance and current exception levels. The purpose of this upper section is to give the procurement director a rapid understanding of the current performance situation without the need to move immediately into detailed transaction level analysis. The lower part of the page provides a more structured view of spend and supplier-related concentration. A top 5 supplier by spend chart highlights the largest suppliers in monetary terms and total spend by site visualization shows how total purchasing is distributed across different units. Supplier level late order analysis helps identify which suppliers contribute most to delivery delays, thereby linking high level management monitoring with concrete supplier performance issues.

4.3.2.3 Purchaser page

In purchaser view the wanted outcome was to create a design which supports the daily operative work of buyers by bringing together late orders, unconfirmed orders and short-term delivery risks in one page. In contrast to director view, which is more aggregated, this purchaser view focuses on the concrete order lines that require action an aim to replace the manual scanning in ERP system, which was described in the interviews of buyers.

Figure 5. Purchaser view

As Figure 5 shows the top of the page follows the same pattern as other pages including KPI cards. In this page KPI cards summarizes the current status of the purchaser's order backlog. The main indicators are the number of late order lines, the number of unconfirmed order lines and the volume of orders due on the next business day. All these measures inside KPI cards are calculated from ERP data with DAX measures. The purpose of these KPI measures is to give a quick situational snapshot and are intended to help purchasers prioritize which parts of the backlog need attention first. Purchasers can filter

page and by clicking wanted KPI card or wanted bar in one of the charts purchasers can drill-through to page KPI info, which is hided drill-through page where is only three tables which shows filtered information about late order lines, unconfirmed order lines and due next business day. Via clicking bar on any chart where is supplier, user can also drill-through to supplier view straight away and see situation related to clicking bar.

The middle section of the page uses supplier level bar charts to highlight where the main problems are concentrated. Separate visuals show, for example, which suppliers are associated with the most late order lines, which suppliers have the highest number of unconfirmed orders and which suppliers are linked to upcoming due dates in the very short term. By grouping these problematic lines at supplier level, the view supports preparation for supplier discussions and makes it easier to identify recurring patterns rather than treating each exception as an isolated case. The lower part of the page includes a time-series visualization of on-time delivery percentage development. This measure is very important and that is the reason why it is included in most of the views. By filtering supplier or clicking wanted supplier in some visualization, on-time delivery visualization show delivery reliability of that exact supplier. Together with the right-hand filters, which allow the user to restrict the analysis to a specific supplier, order or site, the purchaser view functions as a practical work tool that integrates monitoring and follow up into a single dashboard page. Important thing is missing at the moment due to the problems in data integrations and that is the missing of slicer in filter box at the right-hand side which filters purchaser number. This is crucial for this view so that user can filter down own situation.

4.3.2.4 Category manager page

Design behind the category manager view was the purpose of supporting category level management by combining spend analysis, supplier structure and development trends on a single page. Category manager view see the Figure 6 below and its first version in Power BI dashboard the data was not available to provide actual category based data so

for this first version it was impossible to provide visualizations that measure different categories. So, for this first version the target was to meet the needs of category managers understanding of how purchases are distributed across suppliers, sites and time, and how spend is developing overall.

Figure 6. Category Manager view

Difference between other pages and category manager page is that KPI cards at the top of the page shows more spend related indicators for the selected category and time frame. The indicators includes total spend, spend in the corresponding period of the previous year and the year over year change in both euros and percentage and again all calculated directly from ERP data. These KPIs provide a compact overview of the size, development and direction of spend and are intended to support quick assessment of whether the spending is growing on curtain supplier or not. In future when it possible adding category data in this view it provides more help for category managers so they can measures their specific categories. This includes of course this whole page and its visualizations.

The middle section of the page focuses on supplier structure and the distribution of work and value across suppliers. Separate bar charts show the top 10 suppliers by number of order lines and the top 10 suppliers by spend per site, highlighting the difference between operational transaction volume and financial significance. By clicking or selecting from filters the wanted site for example, the views visualizations adapt to it and gives information per site. This provides good information about per site that which suppliers are important and need better supplier leading. So these visualizations gives good information also to purchasers who can of course use this view. The lower part of the view presents the development of top 10 suppliers by spend and total spend over time as a time-series visualization. This allows users to identify trends, seasonal patterns and sudden changes in order volumes or values that may require further analysis. With the use of filters on the right hand side, the category manager view is intended to function as a flexible analysis tool that links the information needs which came up in interviews on spend visibility and supplier performance to a concrete dashboard page that can be used in day to day category management and longer term planning. Some critical data as said earlier was not ready for this first version, but this are good improvements for future.

4.3.2.5 Supplier page

KPI cards in this view are mix of key figures for the chosen supplier. The indicators include total spend, spend year over year percentage, the number of late order lines and the number of unconfirmed order lines for the selected period. Together these KPIs give a concise overview of how significant the supplier is in monetary terms and how many operational issues related to delivery and confirmations are currently associated with the supplier.

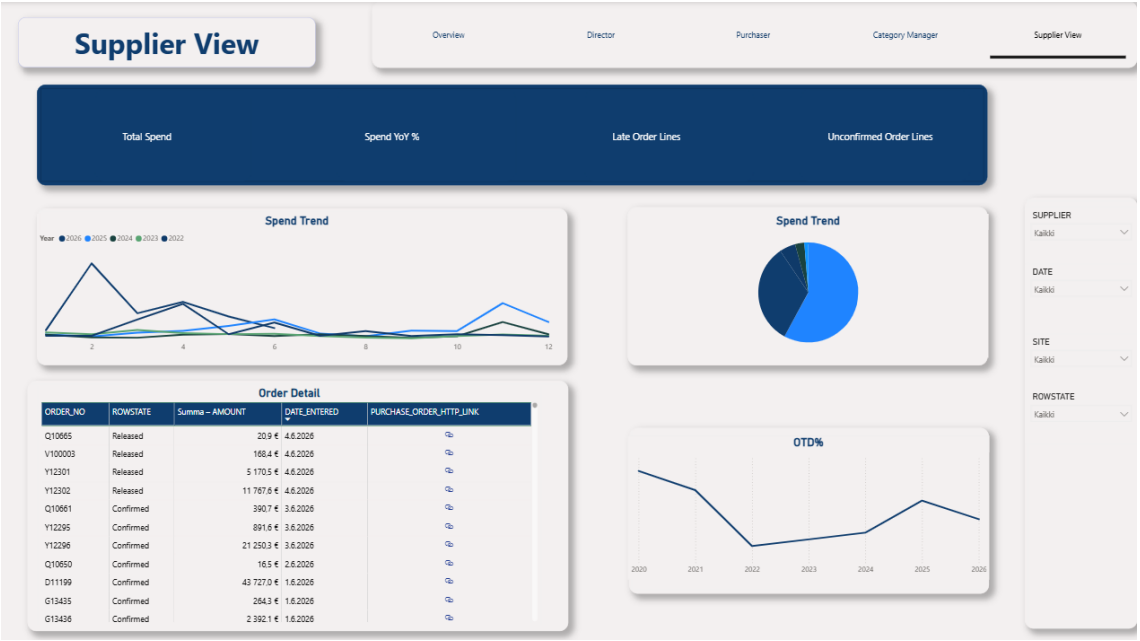

Figure 7. Supplier view

Figure 7 show the view and the other four visualizations which focuses on trends and structural distribution. Spend trend visualization and spend by site visualization are used in other pages as well but in this pages these visualizations illustrate how the exact supplier purchases are distributed across the organization and how it has evolved over time. This supports every role on assessing specific supplier dependency. At the lower part of the page contains an order detail table along with on-time delivery percentage. Order detail table lists the supplier's purchase order lines at row level. Typical fields include the purchase order number, row state, value, creation date and a specific link to the ERP system, which allows users to move from analytical review directly to operative follow up when needed. A time series chart shows the development of the supplier's on-time delivery percentage over time, enabling users to see whether delivery reliability has improved or deteriorated during the selected time frame. Overall the supplier view functions as a basic view and also drill-through page that connects high level supplier KPIs to the underlying order lines and supports more fact-based supplier discussions and performance management.

5 Conclusions

In this final chapter of this thesis I will present the conclusions. Chapter summarizes first the main findings of the study and then discusses them in relation to the literature and the design science research methodology perspective. After these the chapter considers the practical implications of the developed dashboard for the case company, reflects on the limitations of the study and outlines suggestions for future research and further dashboard development.

5.1 Summary of key findings

This thesis set out to develop a Power BI–based procurement performance dashboard for a centralized procurement team and to examine how such a dashboard can be designed to support the team's information needs in everyday work and managerial decision-making. Based on the literature review, the methodological choices and the empirical findings, the study produced both an understanding of the procurement team's key reporting needs and a first artefact version that translates those needs into a practical dashboard solution. The main findings of the thesis can therefore be summarized from two closely connected perspectives, which are the information needs identified through empirical analysis and the design implications that guided the development of the dashboard artefact.

5.1.1 Findings on procurement information needs

The first key finding of the study is that procurement performance measurement in the case company was not perceived mainly as a lack of potentially useful metrics, but rather as a lack of accessible, reliable and role-relevant information in one place. The thematic

analysis showed that users did not primarily ask for more reporting in general, but for better visibility into the issues that matter in daily procurement work. In particular, the findings highlighted four central themes: data availability and reliability, workload visibility and operational follow-up, supplier performance and spend for decision-making, and usability and integration into daily work. Together, these themes show that the procurement team's information needs are strongly practical and decision oriented. The key issue is not simply measuring performance for reporting purposes, but making procurement-related data usable in a way that supports prioritization, follow-up and action in different roles.

The first empirical theme, data availability and reliability, indicated that even where relevant procurement data existed in the company's systems, users did not necessarily experience the information as easily available, sufficiently structured or fully reliable for performance monitoring. Interviewees described situations in which relevant data were scattered across systems or reports, where some desired indicators were difficult to retrieve, and where the quality or consistency of the available data limited the usefulness of performance measurement. This finding is important because it shows that dashboard development in procurement is not only a matter of selecting theoretically relevant KPIs. It also requires attention to the actual availability, consistency and interpretability of the source data that underlie those indicators. In this study, the need for reliable and understandable data emerged as a foundational requirement for any meaningful dashboard solution.

The second key theme concerned workload visibility and operational follow-up. The interviews showed that members of the centralized procurement team needed better visibility into ongoing work, open tasks and the current operational situation. This was not only a question of managerial monitoring, but also of supporting the everyday work of procurement professionals who need to identify priorities, react to exceptions and maintain an overview of their responsibilities. The findings suggest that procurement performance measurement in this context is partly operational by nature: users need

dashboard views that help them manage workflow, monitor statuses and notice issues requiring immediate attention. In this sense, the dashboard is not merely a retrospective reporting tool, but also a practical interface for operational follow-up.

The third key finding relates to supplier performance and spends for decision making. Interviewees expressed a clear need for better visibility into suppliers, purchasing volumes and delivery-related performance in order to support both short-term decisions and broader procurement management. This included interest in indicators that make it easier to compare suppliers, identify concentration of spend, observe delivery reliability and support discussions related to procurement performance. The findings therefore suggest that procurement dashboards in a centralized team should support not only internal process visibility but also external supplier-related decision-making. Especially in a project based business environment, the ability to combine spend and supplier performance information in one reporting environment appears highly relevant.

The fourth empirical theme, usability and integration into daily work, emphasized that even a technically sound dashboard creates value only if it is easy to use and fits the actual routines of its users. The interviews indicated that procurement professionals value clarity, ease of interpretation and the possibility to access relevant information without excessive manual effort. This means that usability is not a secondary design consideration, but one of the central conditions for dashboard adoption. The findings also showed that different roles within the procurement team have partially different information priorities. As a result, the dashboard should not be designed as a one-size-fits-all reporting view, but rather as a solution that combines an overall picture with role-specific and cross-role possibilities for drilling down into the data.

Taken together, the empirical findings suggest that the information needs of a centralized procurement team are multidimensional. They involve the need to monitor operational activities, support supplier and spend-related decisions, and improve the overall visibility of procurement performance. At the same time, the findings underline that the

usefulness of performance information depends on accessibility, clarity and fit with work practices. In this respect, the study indicates that the development of a procurement performance dashboard should be understood as a design task where information needs, KPI definitions, data availability and usability considerations must be combined into one coherent artefact.

5.1.2 Findings on the dashboard artefact

The second main set of findings concerns the dashboard artefact that was developed based on the literature review, the interview findings and the available ERP based data environment. The result of the study was a first Power BI based dashboard concept for the case company's centralized procurement team. The artefact was designed to bring together procurement-related information into a more unified and usable reporting interface, rather than leaving the information fragmented across different views or systems. In practical terms, the dashboard translates the identified information needs into a set of KPI-based visualizations and views that support both overview-level monitoring and more detailed follow-up for different user roles. A key finding related to the artefact design is that an overview page alone is not sufficient for a procurement dashboard intended for different professional roles. The empirical findings indicated that users need both a shared overall picture and more focused views that reflect their specific responsibilities. For this reason, the final dashboard design adopted a hybrid structure in which a shared overview page and a cross-role supplier page are complemented by three role-specific pages tailored to the needs of the procurement director, buyers and category managers. This reflects the practical reality of the centralized procurement team: while all users benefit from a common understanding of overall procurement performance, buyers, category managers and leadership still require different levels of detail and different ways of interacting with the data.

Another important finding is that the dashboard artefact is closely dependent on the case company's existing data architecture. In this thesis, the dashboard was not built

from manually collected spreadsheets or separately cleaned offline datasets, but on top of an existing live Power BI connection based on the company's data warehouse and semantic model. This means that the artefact development was shaped not only by user needs and KPI selection, but also by the logic and limitations of the existing technical environment. As a result, the study highlights that procurement dashboard development in practice is always both an analytical and a technical design process. The developed artefact therefore represents a feasible first implementation that fits the current organizational and technical setting of the case company.

Altogether, the key findings of the thesis show that developing a procurement performance dashboard for a centralized procurement team requires more than selecting a list of indicators from the literature. It requires understanding the specific information needs of users, recognizing the operational and managerial uses of procurement information, and translating these into a technically feasible dashboard design within the existing data environment. This is how combining these findings on information needs and the developed Power BI dashboard together provide an answer to the research question of how a procurement performance dashboard can be developed to support the information needs of a centralized procurement team.

5.2 Discussion in light of literature and DSRM

This thesis addressed the research question: How can a Power BI-based procurement performance dashboard be developed to support the information needs of a centralized procurement team. Based on the empirical findings and the designed artefact, the study suggests that such a dashboard can be developed by first identifying role specific and cross-role information needs through thematic analysis of interviews, then structuring these needs into multidimensional KPI categories grounded in procurement performance literature, and finally implementing a hybrid dashboard structure in Power BI that combines a shared overview page, few role-specific pages for the team members and a cross-role supplier page on top of an ERP-based data model.

The findings of this thesis support the general view in performance measurement literature that useful measurement systems must be multidimensional and linked to decision-making rather than limited to a narrow set of financial indicators. Neely et al. (2005) emphasize that performance measures should be aligned with organizational goals and should support both efficiency and effectiveness, while Neely (2007) stresses that they should help organizations understand how well different parts of the organization fulfil their objectives. In the case company, procurement performance was not perceived primarily as a lack of new metrics, but as a lack of accessible, reliable and role-relevant information in one place. This observation is consistent with these theoretical arguments about the main challenge was not to invent new KPI categories, but to make existing performance dimensions visible and usable in a coherent way.

From the perspective of procurement specific literature, the results of this thesis align well with established frameworks. Van Weele (2018) presents purchasing performance as the sum of several dimensions, including price and cost, quality, logistics, supplier relationships and the purchasing organization. The empirical themes identified in this study as data availability and reliability, workload visibility, supplier performance and spend, and usability. These can be seen as a practical translation of these dimensions into the everyday information needs of a centralized procurement team. The need to monitor both operational workload and supplier-related performance suggests that procurement dashboards should support internal process visibility and external supplier management simultaneously, which is also in line with the ideas of centralized procurement presented by Waditwar (2023).

The design and implementation of the Power BI dashboard are also broadly consistent with the business intelligence and dashboard principles discussed in the literature. Pirttimaki (2007) describes business intelligence as a process that starts from information needs and moves through data collection, integration and analysis to support decision making. Heang & Mohan (2017) underline the importance of data warehouses

and semantic models as a basis for BI solutions, while Yigitbasioglu & Velcu (2012) define dashboards as decision support tools that aggregate key metrics, reduce information overload and allow users to drill down into underlying data. The artefact developed in this thesis follows these principles by building it on top of the company's ERP-based data warehouse model, it uses a common semantic model and filters across all pages, and it provides both high level indicators and drill-down possibilities to order and supplier level. This suggests that the case company's dashboard is not only a technical implementation, but also a concrete application of BI and dashboard design ideas in a procurement context.

From a methodological standpoint, the results are consistent with the logic of design science research methodology. Hevner et al. (2004) argue that design science research should produce artefacts that are grounded both in relevant problems and in an appropriate knowledge base. In this thesis, the literature on performance measurement, procurement and dashboards provided the conceptual basis, while the interview-based thematic analysis clarified the concrete information needs and challenges in the case company. Peffers et al. (2007) present DSRM as a process that starts from problem identification and solution objectives and continues through design, development, demonstration and evaluation. The development of the dashboard in this study follows this pattern more or less, the problem of fragmented procurement reporting and limited visibility was identified and solution objectives were defined based on theory and empirical findings. Then a Power BI dashboard was designed and implemented on top of the ERP data model and the artefact was demonstrated and its future developments was discussed with key users. In this sense, thematic analysis and DSRM are not competing approaches, but complementary elements of the same research design. Thematic analysis was used to structure and interpret user needs and information problems, which then served as input for the design and development of the artefact in the DSRM process. The dashboard can be seen as a first design-oriented answer to the research question. It operationalizes the literature-based principles of multidimensional performance measurement and user-centered BI design in the specific context of a centralized procurement

team. Further DSRM cycles could focus on deeper evaluation and iterative refinement, but even this initial cycle demonstrates how a theoretically informed and empirically grounded artefact can be developed to support procurement information needs in practice.

5.3 Implications for the case company and dashboard design

For the case company the developed Power BI dashboard provides a concrete means to move from fragmented, report-specific procurement information towards a more unified and role-relevant view of performance. The Overview page and shared filters offer a common quick single picture of rolling twelve months, which can be used in management meetings and daily follow-up, while the Director, Buyer and Category Manager pages support more detailed monitoring and prioritization for these roles. The Supplier page, in turn, creates a shared basis for supplier-related discussions by combining supplier level spend, delivery performance and exception indicators in one place, which can be used both in internal preparation and in supplier meetings.

The artefact also has implications for how procurement reporting and IT solutions are developed in the company. Because the dashboard is built on the existing ERP-based data warehouse and semantic model, it demonstrates that a procurement performance dashboard can be implemented without separate offline datasets, but it also makes visible where data structures, data quality and category definitions need further development. To take this into everyday work it means that dashboard use and data management should be developed together. As the dashboard becomes part of procurement routines, feedback on missing or unclear indicators can be used to guide further improvements in the data environment. In terms of design science research, these implications indicate which aspects of the artefact already address the identified problem of fragmented reporting and which areas such as extended KPI content, broader user training or integration into formal performance reviews, should be prioritized in future design iterations.

5.4 Limitations and future development

This study has several limitations that should be acknowledged when interpreting its results. First, the empirical part focused on one centralized procurement team in one business unit, and the dashboard was developed based on one ERP based data environment, which limits the broader generalization of the findings. Second, the study focused on direct procurement and only on those performance dimensions for which sufficiently usable data were available in the case company, which means that some relevant aspects of procurement performance remained outside the implemented dashboard. Third, the evaluation of the artefact remained limited, because the study did not include a long-term assessment of how dashboard use affects procurement performance, decision quality or everyday work practices over time.

From the perspective of the DSRM process, the thesis can be seen as completing the early and middle phases of design science research more clearly than the later ones. The study identified a relevant practical problem, defined solution objectives because of literature and interview findings, and produced a concrete Power BI artefact that was demonstrated in the case context. In this sense, the problem identification, objective definition, design and development, and initial demonstration phases were addressed relatively well. By contrast, the evaluation phase remained narrower, because the artefact was not tested through extended use, quantitative outcome assessment or multiple iterative redesign cycles. This also provides an important reflection on the nature of the artefact produced in this thesis. The dashboard should not be seen as a final or fully validated solution, but rather as a first design-oriented implementation that translates literature-based principles and empirically identified user needs into a feasible reporting solution for the case company. A fuller DSRM process would require further evaluation rounds in which the actual use of the dashboard, the relevance of the selected KPIs and the effects of the dashboard on procurement decision-making would be examined more systematically.

5.5 Suggestions for future research and dashboard design

Based on the limitations and results of this thesis, several directions for future research and further dashboard development can be identified. There is a need for more comprehensive evaluation of the dashboard's effects on procurement performance and decision making. This could include longitudinal analyses of KPI trends before and after dashboard implementation. User could study on how different roles use the views in their daily work and assessments of how the dashboard influences, for example, backlog management, delivery reliability or supplier related decisions. Such studies would strengthen the evaluation phase of the design science research process and provide more systematic evidence on the practical impact of the artefact. Future development could also focus on extending and refining the content of the dashboard as the data environment matures. This may involve adding new indicators related to quality, risk and process performance, improving category and supplier structures, and integrating additional data sources where relevant and feasible. As suggested in recent literature on business intelligence and AI-enhanced dashboards, the current Power BI solution could also serve as a platform for stepwise integration of more advanced analytical features, such as simple predictive indicators or automated alerts for unusual spend patterns or changes in supplier reliability (Saidur, 2025). However, such developments would need to be based on more advanced data and designed in a way that procurement professionals can understand and trust.

Future research could examine how similar dashboard solutions work in different organizational contexts. Comparative case studies between business units or companies could explore how variations in procurement organization, data architecture and management practices influence dashboard design and use. This would make it possible to assess which elements of the artefact are specific to the case company and which design principles might be transferable to other centralized procurement teams.

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Appendices

Appendix 1. Interview questions

1. Describe your role and responsibilities within the company?
2. What are your most important tasks in your daily work?
3. Are you currently tracking any figures or key figures in your work (e.g. delivery reliability)?
4. How do you currently monitor the progress or success of your work if there are no actual measures yet?
5. What information would you need to get a better overall picture of your work?
6. What things do you think should be measured in purchasing or in your work?
7. If you had to choose the three most important measures for your field of work, what they would be?
8. How would such measures help you in practical work?
9. What kind of measures would be easy for you to use?
10. What would make measures easy to use in day to day work and not just in monthly reports?
11. What should be considered so that potential new metrics actually support your work and do not add unnecessary workload for you?