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# Designing a Data-Driven Purchasing Process

In the context of an ERP transition

Master's thesis in the Master's Program Supply Chain Management

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A case study at Jan Comstedt AB

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# Designing a Data-Driven Purchasing Process in the Context of an ERP Transition

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## SUMMARY

This study examines how a more data driven purchasing process can be designed at Jan Comstedt AB, a wholesale distributor operating in the Nordic region within the boating and sport fishing industry. The study was conducted in the context of a system transition from a legacy DOS-based system to Microsoft Dynamics 365 Finance and Operations. The transition was triggered by the acquisition by Alliance Marine in 2022, and acted for both a technical upgrade and a broader organizational transformation.

The study has a mixed-method research design, combining semi structured interviews with employees across different departments with a quantitative analysis of 50 selected products from Comstedts products portfolio. The Gioia methodology was used to analyze the qualitative data and produced five aggregate dimensions covering experiences of the legacy system, the transition process, organizational change, data quality, and perceptions of the outcome. The quantitative section utilized ABC/XYZ classification, forecasting simulations using moving average and exponential smoothing evaluated through MAPE, and safety stock calculations based on cycle service levels for its analysis.

The result from the study reveals that the technical foundation for a data-driven purchasing process exists within the new system of Dynamics 365. Theories such as ABC/XYZ classification and safety stock models are implementable with the existing data. However, the result of the forecast accuracy revealed that the data quality appeared to be a critical barrier. The result was severely limited by misplaced demand caused by stockouts, untagged one-off orders, and generalized lead times set in 30-day intervals. These issues resulted in MAPE values of approximately 95-99% and a

near complete collapse of the XYZ classification, with 48 out of 50 products classified as Z-items.

The qualitative findings revealed how the new system's capabilities are utilized and affected by the employee perceptions of the change. The results were not in line with existing change management theory, despite a top-down implementation with limited formal training, resistance was low. The results were influenced by the legacy system which was widely regarded as outdated. Nevertheless, uncertainty, selective trust in system outputs, and unrealized potential remain prevalent across the organization.

The findings from the study concludes that a hybrid approach for purchasing should be applied. Using system outputs as a first signal which should be reversed and validated through qualitative judgement. Improving data quality is an essential rather than a suggestion. The purchasing function should also develop a more strategic role which requires both continued technical configuration and active organizational commitment.

Keywords: data-driven purchasing, ERP implementation, Microsoft Dynamics 365, ABC/XYZ classification, demand forecasting, safety stock, change management.

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# 1. Introduction

Over the past decades, technological development has progressed rapidly and has affected everything from production and inventory management to purchasing and administrative tasks. Advanced business systems, data analytics tools, and artificial intelligence are becoming increasingly common among today's companies. As a result, organizations are required to continuously develop to maintain competitiveness and remain resilient in an ever-changing business environment.

Liu et al. (2018) describes an organization as a system that stores, manage and creates information. Society has become more digitalized and our relationship to technology has changed. In a case study, the authors found that technology can affect how communication and information can be used within an organization. IT-platforms and human information serve as two foundations in today's modern organizations. IT-platforms serve the technical operation, while human information is capturing the social dimension of business activities (Liu et al., 2018). Both the IT-system and human information are interconnected, which is shown in an example of a restaurant who implemented a point of sales (POS) system. The new system allowed the waitress to make changes directly in a POS terminal with a touch screen, instead of the previous system of paper and pens where the waitress made a note of the change and delivered the paper to the kitchen. The new IT-system changed the pattern of communication as there were no need for the waitress to walk to the kitchen anymore (Liu et al., 2018).

One central function in many companies impacted by digitalization is the procurement department. Viale & Zouari (2020) states that the 4.0 industrial revolution has had significant effects on the digitalization of the procurement process. Digitalization has changed the way and structure of procurement and has become important for an organization's context of strategic procurement. This change affects both how the previous sourcing strategies can be aligned, but also how future sourcing strategies can be designed. Depending on how digitalization has been implemented directly correlates with the competitive advantage of the organization (Viale & Zouari, 2020). Büyüközkan and Göçer (2018) review the digital supply chain and explain how digitalization allows for use of big data to make intelligent decisions across the whole

supply chain. The use of data-driven decision-making can enhance the responsiveness of the organization as sophisticated analytics can help make decisions quicker. Data-driven decision-making also allows for better adaptability and reliability which can contribute to a more proactive approach (Büyüközkan & Göçer, 2018). The process of digitalization can face challenges with planning guidelines and required tools, lack of collaboration both from external associations, and gaining input from internal functions (Büyüközkan & Göçer, 2018).

## 2. Research purpose

The purpose of this study is to examine how a more digitalized and data-driven purchasing process could be designed in a small wholesale company undergoing a business system transition as a result of an acquisition by an international group. The focus is on identifying which decisions in the purchasing process can become more data-driven and which parameters need to be manually defined in the Microsoft Dynamics 365 Finance and Operations master planning tool, thereby preparing the company for this transition.

### 2.1 Objectives

The overall objective of the study is to analyze Comstedt's current procurement process and to examine the tools provided in Microsoft Dynamics 365 Finance and Operations in order to prepare and support Comstedt during this transition. Furthermore, system data will be reviewed and analyzed to serve as a basis for the parameters that are manually configured in the new business system's master planning tool.

### 2.2 Research questions

The study investigates two interrelated but complex areas. The first one being the development of a data driven purchasing process and the second being the implementation of a new business system. Both areas involve different decisions, technical and organizational considerations. To structure the research the study will be guided by two research questions, these questions will take the overall purpose into detail. The research questions are conducted to capture the operational aspects of data-driven purchasing decisions and the organizational implications of the ongoing system transition.

RQ1: How can a more data-driven purchasing process be designed in the context of a transition to Microsoft Dynamics 365 Finance and Operations?

RQ2: How do employee perceptions of a new ERP system implementation influence the development of data-driven purchasing processes?

## 2.3 Limitations

To limit the scope of the study, the effects and data to be analyzed are within the field of the purchasing process. This is because the purchasing process is facing major effects from the system change and needs to be restructured. Data for the investigation will be limited from September 2024 until October 2025. Additionally, it was agreed with the case company not to expose any specific and detailed information about suppliers. Furthermore, the results will be context specific as the study will be a single-case study. Therefore, the results may not be generalizable. Instead, they could be used analytically for similar small to medium size firms.

The study is conducted during the early stages of the implementation of the new system Microsoft Dynamics 365 Finance and Operations, therefore many aspects within the system might not be configured yet. The result will therefore focus on the potential and intended data-driven purchasing process.

## 3. Theoretical framework

This section will introduce relevant theories, models, and concepts that will be used for research. Understanding these frameworks will help explain relations, key concepts, and connect the methodology of choices and the analysis of empirical data.

### 3.1 Procurement and Purchasing theory

Purchasing has had a view of being an administrative task, but for the past years the function has developed to become integrated in the strategic decision making. This section introduces theories and frameworks related to purchasing in order to build a foundation to analyze Comstedt's purchasing process.

#### 3.1.1 Purchasing process

Historically, purchasing has been seen as a tactical or administrative function for a firm, but later it has developed to a strategic function characterized by a pattern of decisions aimed to develop a sustainable competitive advantage for firms (Carter & Narasimhan, 1996). Purchasing tends to be seen as a siloed function for a firm. However, Carter and Narasimhan (1996) discuss the effect purchasing can have when integrated into other contexts of the firm. Top management should put emphasis on purchasing, as this function directly affects customer satisfaction, and is a foundation for other functions for the firm and needs to be planned together. Porter (1999) has developed a framework for a structure pattern to use for the purchasing process. The framework contains ten steps to be followed to achieve a strategic purchasing process. For this study, focus will be placed on step five to find how data can be used in the purchasing process for Comstedt, and step seven to develop a sourcing strategy.

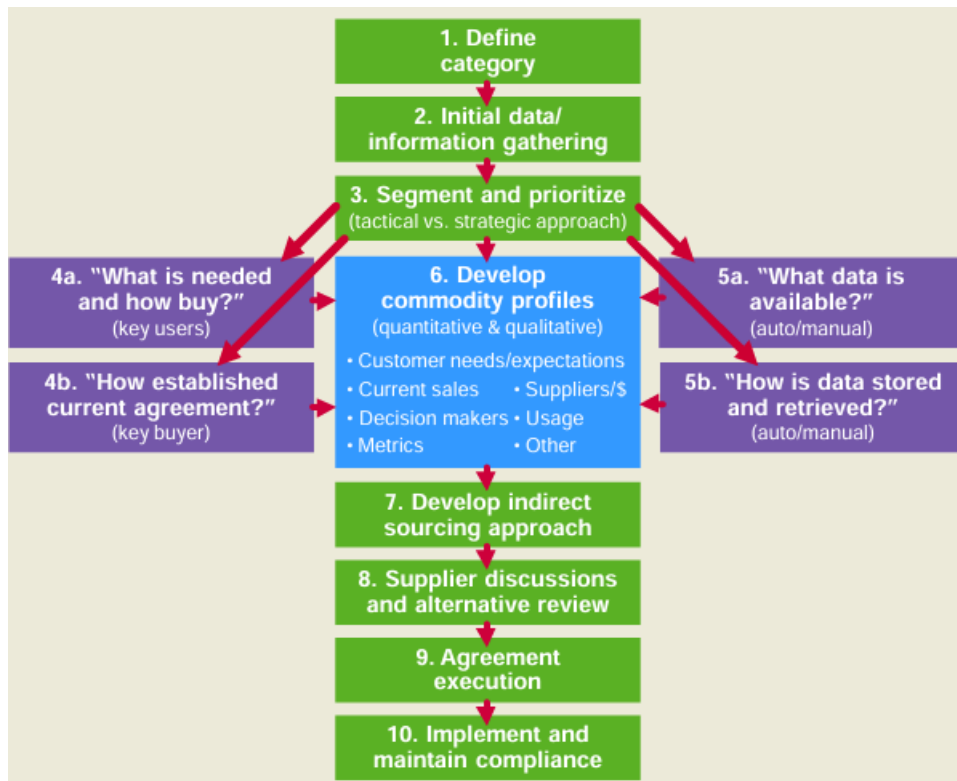


Figure 1: Porter's purchasing process

### 3.1.2 Purchasing strategy and segmentation

Kraljic (1983) presents a framework known as the Kraljic matrix that can be used to go from previous tactical procurement to strategic procurement. The foundation of the framework is to develop differentiated sourcing strategies based on two dimensions, profit impact and supply risk. The two parameters form four quadrants that can be seen in figure 2.

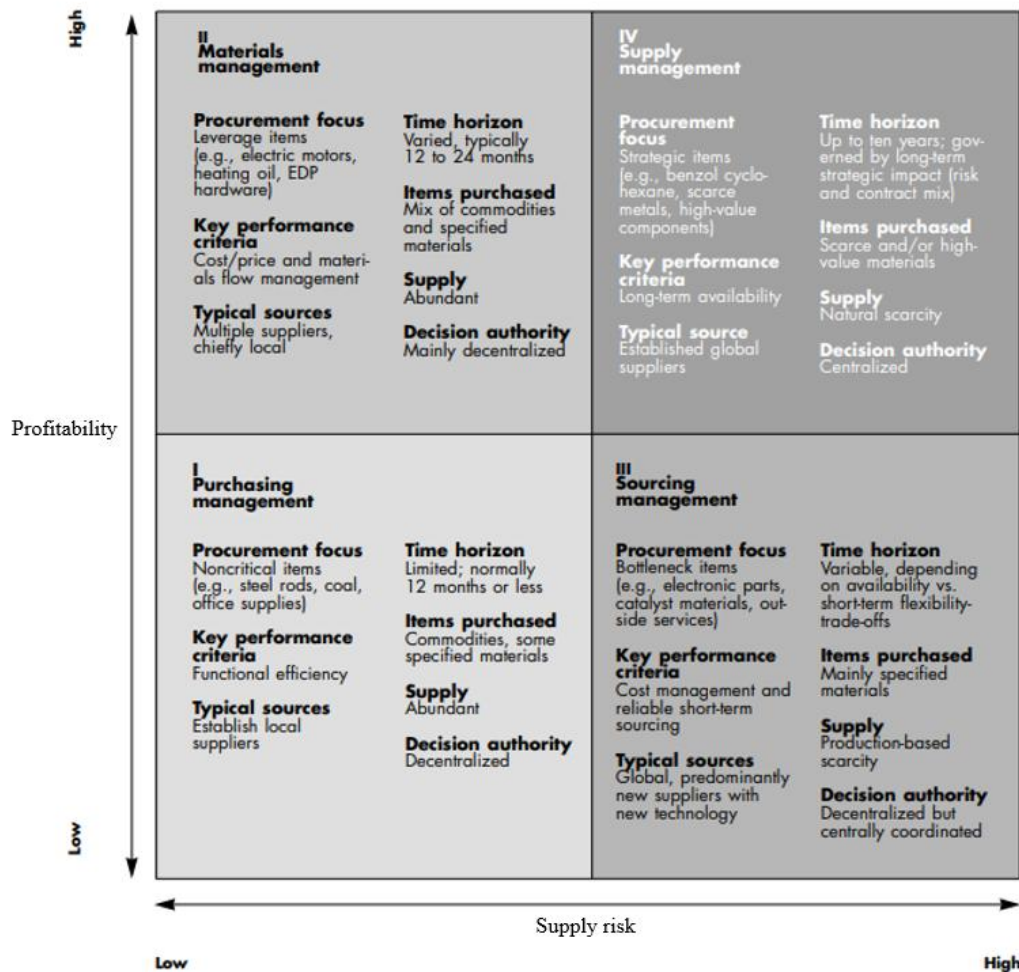


Figure 2: The Kraljic matrix

Each quadrant requires different strategic approaches (Kraljic, 1983). The first quadrant represents *Non-critical Items* (low profit impact, low supply risk). In this section, the purchasing process should aim to reduce administrative complexity and ensure efficiency. The second quadrant is *Bottleneck Items* (low profit impact, high supply risk). Here, the purchasing process should focus on ensuring supply without putting too much effort into the process. Maintaining extra safety stock can be an example of an approach. The third quadrant of the matrix is *Leverage Items* (high profit impact, low supply risk). The strategy for items within this category is to procure at a low price. Competitive bidding among suppliers can be a relevant approach. The last category is *Strategic Items* (high profit impact, high supply risk). In this category, the purchasing process should aim to handle the high supply risk. An approach to this is to form long-term partnerships with suppliers.

## 3.2 Inventory Management and Planning theory

Inventory management and planning aim to balance the two parameters of product availability and inventory-related cost. Purchasing decisions, demand uncertainty, and supplier performance are a foundation for effective inventory management. The theories in this chapter give a structured approach to determine how and when to order, as well as how to manage uncertainty through mechanisms such as forecasting, safety stock, and service level definitions.

### 3.2.1 Demand forecasting

In the article *Forecasting: theory and practice* (Petropoulos et al., 2022), 80 authors have contributed to providing a comprehensive reference point for research conducted in the field of forecasting over recent decades. According to the authors, forecasting is a central component of decision-making and planning and is grounded in the idea that “...current and past knowledge can be used to make predictions about the future”. The main idea is to use historical data to identify patterns and estimate future values as accurately as possible in relation to actual outcomes. Forecasts can be produced in various ways and for different purposes. For example, they can be used to predict specific events such as equipment failure (Petropoulos et al., 2022) or to estimate future demand for products (Jonsson & Mattsson, 2009).

#### 3.2.1.1 Qualitative forecasting methods

Forecasting methods used for demand forecasting can be divided into qualitative methods and quantitative methods (Jonsson & Mattsson, 2009). The first category, qualitative methods, refers to approaches that are based on human judgment, expertise, and intuition (Petropoulos et al., 2022). These methods rely on experience and knowledge of the market to support decision-making, rather than on quantitative calculations, and can be applied in various ways. This may, for example, involve a sales manager making individual assessments without following any specific procedures, or a group of individuals coming together to make judgments within more formal settings and according to predetermined processes (Jonsson & Mattson, 2009).

One qualitative forecast approach is the sales management approach (Jonsson & Mattsson, 2009). Here, individuals within the organization come together to jointly review relevant data to form a shared understanding of the future and produce a

forecast. When dealing with longer time horizons and strategic decisions, it is typically members of management who participate (Jonsson & Mattsson, 2009). The individuals involved vary depending on the size of the company, but in a smaller organization this may include the CEO, CFO, logistics manager, and purchasing manager. For shorter time horizons and more tactical decisions, the same principles apply. However, in these cases, it is often only senior personnel within marketing and sales who are involved. The main advantage of the sales management approach is that forecasts can be produced quickly and that a shared perspective is established, thereby reducing the risk of different departments or individuals acting on isolated or individual judgments (Jonsson & Mattsson, 2009). However, a limitation of this approach is that those individuals who are closest to the market and possess the most detailed market knowledge are not necessarily the ones with the greatest influence over the decisions being made (Jonsson & Mattsson, 2009). Additionally, when forecasts are based on experience and subjective judgments, there is a risk of bias, which may result in forecasts that do not accurately reflect reality.

To address the risk of decisions being made by individuals with limited insight into the market, the grassroots approach can be applied (Jonsson & Mattsson, 2009). This approach involves personnel with direct contact with the market (for example, sales representatives) producing their own forecasts based on their own assumptions, which are then reviewed and processed centrally within the organization. After potential adjustments by management and senior decision-makers, a common forecast is established for the entire company. The main advantage of this approach is that forecasts are produced by individuals who are in direct contact with the market, and these are also the individuals responsible for achieving the forecasted values (Jonsson & Mattsson, 2009). However, since sales personnel are responsible for generating the forecasts, there is a risk that targets may be set either too high or too low based on previous performance, which can result in an inaccurate representation of reality. In addition, this approach is more time-consuming compared to the sales management approach (Jonsson & Mattsson, 2009).

### *3.2.1.2 Quantitative forecasting methods*

Quantitative forecasts are rooted in calculations using historical data (Jonsson & Mattsson, 2009), and the underlying theory is that current and historical knowledge can

be utilized to make reliable predictions about the future (Petropoulos et al., 2022). There are many different variants of quantitative forecasts, but two of the most common are moving average and exponential smoothing (Jonsson & Mattsson, 2009).

The simplest forecast is to assume that the demand for the upcoming period will be equal to the demand in the previous period. This approach runs at a high risk of being greatly affected by random events. To reduce the impact of random events during previous period moving average takes the average of several previous periods to produce a forecast for upcoming period. The number of periods included in the forecast needs to be decided upon, more periods give more stability, but it makes it less responsive to changes and trends (Jonsson & Mattsson, 2009). Moving average is calculated using Equation 1.

$$F(t + 1) = (D(t) + D(t - 1) + \dots + D(t - n + 1))/n \quad (1)$$

$F(t+1)$  = Forecast for upcoming period

$D(t)$  = Actual demand during period t

n = Number of periods in the moving average forecast

Exponential smoothing uses the forecast for the previous period and the actual demand of the previous period to generate a forecast for the upcoming period. It uses  $\alpha$  to determine how much weight that should be put towards each parameter, and  $\alpha$  needs to be less than 1 but more than 0. Low value of  $\alpha$  is useful for products with low variation, a higher alpha value is better for more volatile demand as it adapts quicker to recent observations. Exponential smoothing is calculated using Equation 2.

$$F(t + 1) = \alpha \times D(t) + (1 - \alpha) \times F(t) \quad (2)$$

$F(t+1)$  = Forecast for upcoming period

$D(t)$  = Actual demand during period t

$F(t)$  = Forecast previous period

$\alpha$  = Smoothing factor

These two methods does not take systematic trends into consideration. Systematic trends is something that is repeated during a period but is not covered by the previous period, an example of this is if there is always an increase in demand during summer but in September it always decreases. The periods before September will show an increase in demand, but the systematic trend shows it always decreases. Using trend allows for faster correction of the forecast (Jonsson & Mattsson, 2009). This method can be applied to existing forecasts if sales data for a certain period is available more than once.

Forecast accuracy can be determined using quantitative error metrics which compares the previous forecast to the actual outcome (Jonsson & Mattsson, 2009). One commonly used method for evaluating forecasting error is mean absolute percentage error (MAPE). This method gives a forecast accuracy in percentage of selected principle and dataset, this allows for easy comparison between different forecast models. MAPE measures the average deviation from the forecast compared to the actual outcome and does not take direction of error into consideration. MAPE takes the absolute deviation between the forecast and actual demand and divides it with the actual demand. For multiple periods, the average of all observations is the result (Jonsson & Mattsson, 2009). MAPE is being calculated using the formula in Equation 3.

$$MAPE = (1/n) \times \Sigma(|D(t) - F(t)|/D(t)) \times 100 \quad (3)$$

$D(t)$  = Actual demand during period t

$F(t)$  = Forecast for period t

$|D(t) - F(t)|$  = Absolute deviation between actual demand and forecast

$n$  = Number of periods

Syntetos and Boylan (2005) discusses how to handle the issue of periods with zero actual demand. If those are not treated, the results would be incorrect as it would require deviation with zero. The two possible ways of handling this issue are to assign zero demand periods a very small value or to exclude the periods with zero from the calculation (Syntetos & Boylan, 2005). Montaña Moreno et al. (2013) states that MAPE lower than 10% can be considered highly accurate forecast, 10%-20% good forecast, 20%-50% reasonable forecast, and above 50% inaccurate forecasting.

### 3.2.2 Lead time variability

For a wholesaler, the lead time can be defined as the time required between the initiation of an order to its final delivery (Germain & Dröge, 1990). Lead time variability (LTV) is the deviant in lead time for the same item. The LTV can be considered as a critical internal risk factor that needs to be considered in the strategic decision-making of a supply chain (Bandaly et al., 2016). LTV is directly connected to other areas for a wholesaler such as time and place utility, responsiveness and safety stocks. LTV is also a foundation for the process of supplier selection. Germain and Dröge (1990) argue that wholesalers should select suppliers with good delivery time, meaning that the absolute time to fulfill an order is low. Another criterion for supplier selection is delivery reliability, which reflects the consistency of the lead time provided, often measured as "on-time delivery". For high levels of LTV the strategy of coordinated decision-making is appropriate. Bandaly et al. (2016) suggest that departments should collaborate to ensure operational and financial hedging are rooted in the decision.

### 3.2.3 Safety stock and safety lead time

Jonsson and Mattsson (2009) argue that it is almost impossible to balance the supply of items to the actual demand. One aspect is the uncertainty of the time dimension. For example, a supplier's stated delivery time may turn out to be incorrect. The demand can also differ from the forecast. To handle these uncertainties, safety stock and safety lead time can be applied. The two strategies are rooted in quantity hedging and time hedging. Quantity hedging means having larger quantities available than average demand, and time hedging means scheduling a delivery earlier than it is needed (Jonsson & Mattsson, 2009). Both principles result in extra stock on hand, which can be referred to as safety stock. To determine the size of a safety stock or safety lead time, financial motives need

to be considered (Jonsson & Mattsson, 2009). The correct level needs to balance shortage costs with inventory caring costs. A large safety stock would lead to a low number of shortages, but the inventory carrying cost would be high. Therefore, the optimal stock level is when the cost of the two parameters is as low as possible. To find the optimal solution for a firm, Jonsson and Mattsson (2009) discuss the possibility of dividing products into different categories and assigning them different safety stock or safety lead time.

### 3.2.4 Service level

Service level refers to the firm's capability to deliver directly from stock. It can also be generally defined as the possibility that an order can be fulfilled from items in stock (Jonsson & Mattsson, 2009). Service level takes a fixed value of  $Z$  depending on decided service level, it is then multiplied with the demand variation which is calculated by taking the standard deviation divided by the average demand over time. The standard deviation shows how much the demand varies around the mean demand and is calculated using Equation 4.

$$\sigma_{monthly} = \sqrt{\frac{\sum (X_i - \bar{x}_{monthly})^2}{n-1}} \quad (4)$$

$X_i$  = Demand in period  $i$

$\bar{x}_{monthly}$  = Average monthly demand

$n$  = Number of periods

Finally, it is multiplied with the lead time, the formula can be adapted, so it takes lead time variability into consideration as well, and then gives the final formula presented in Equation 5.

$$SS = Z \times \sqrt{(L \times \sigma^2_{monthly} + D^2_{monthly} \times (CVLT \times L)^2)} \quad (5)$$

$SS$  = Safety stock

$Z$  = Service level factor (based on desired service level)

$L$  = Lead time

$\sigma^2_{monthly}$  = Variance of monthly demand

$D_{monthly}$  = Average monthly demand

*CVLT* = Coefficient of variation for lead time

Using cycle service as service level definition causes items with many inbound deliveries per year to face stock out more often than items with the same service level but with fewer deliveries per year. This is because the service level defines how many stock outs there will be for each replenishment. An example from Jonsson and Mattsson (2009) is if an item has 90% service level and is replenished once every year, a stock out will occur once every tenth year. If another item has the same service level and is replenished twenty times per year, it will result in a stockout twice every year. Teunter et al. (2010) suggest that ABC classification can be used for effective inventory management. The three groups can be based on different criteria, but one commonly used approach is demand value (price  $\times$  volume). Depending on the demand value the product is being put into a category. The parameter for each category needs to be decided upon before. A-items represents the highest priority and C-items the lowest (Teunter et al., 2010). All products within the same category are assigned the same service level, and the A-items has the highest priority. Flores and Whybark (1987) argue that the categorization should follow the Pareto's principle. Pareto found that 20% of the articles tend to stand for 80% of the revenue, and therefore these articles can be prioritized using categorization.

Ronen (1983) defines the service level as a critical decision as it is directly related to the performance and goals of the inventory system. Service level has its roots in the definition of the amount of safety stock for an item. The safety stock should work as a balancing tool, and incorrect levels can lead to loss of sales and additional costs for handling backorders. On the other hand, having too much in safety stock can result in financial drawbacks by capital costs of holding large inventories. The service level aims to find a solution between this trade-off (Ronen, 1983).

### 3.3 Digital transformation and Enterprise resource planning

This section presents relevant articles and theories related to digital transformation, digital innovation, and the implementation of ERP systems, as well as the organizational and socio-technical aspects affected by these processes.

### 3.3.1 Digital transformation and ERP implementation

Aasi et al. (2022) describes digital transformation as a change in how a company adopts and leverages digital tools and technologies to create a digital business model that generates increased value for the organization. Digital transformation also involves organizational change in parallel with the employment of new technologies. These changes affect large parts of the organization, including strategy, organizational structure, and information technology, as well as supply chains and marketing (Aasi et al., 2022). Digital transformation represents a major change that can create significant value for a company if successfully implemented.

A study conducted by the Massachusetts Institute of Technology (MIT) found that digitally transformed businesses are 26% more profitable than companies that have not undergone a digital transformation (Aasi et al., 2022). However, the majority (approximately 70%) of digital transformation initiatives fail to achieve their intended objectives. There are several reasons why this figure is so high. In an article by Celestin and Vanitha (2015), several studies are cited that discuss the underlying causes of the high failure rate in IT implementations and digitalization projects. One of the studies argues that organizations often overlook the human factor during IT projects. Insufficient training and poor communication contribute to barriers to user adoption and instead create resistance among users. Another study shows that organizations fail to consider the socio-technical dimensions involved in the implementation of IT systems. It concludes that digitalization projects frequently fail due to inadequate attention to organizational culture and user involvement rather than due to technical aspects. Furthermore, one of the studies indicates that companies often underestimate the importance of advanced project management and expertise, particularly in IT projects characterized by high complexity.

A major IT innovation introduced during the late twentieth century is Enterprise Resource Planning (ERP). ERP systems enable the integration of a company's information across different departments and functions - such as finance, operations, and procurement - within a single computer system (Davenport, 1998; Somers & Nelson, 2001). A successful ERP implementation - where the system is appropriately selected and effectively utilized - can generate significant benefits for the organization.

Some of the benefits that can be achieved include reduced inventory costs, shorter lead times, and decreased production times (Somers & Nelson, 2001), as well as improved order management and workflows, and a higher degree of standardization of best practices (Katu, 2020).

Although digital transformation and the implementation of ERP systems can generate many benefits, they also involve significant risks. As mentioned earlier, many organizations fail to achieve their intended outcomes. A major reason for this is that digital transformations and information system implementations are influenced by - and in turn influence - more than just system-specific and technical aspects, as discussed previously. Markus and Tanis (2000) argue that the implementation and configuration of ERP systems must be adapted to the organization, while the organization must also adapt and modify its ways of working to align with the system. Furthermore, Gorrell (2020) describes ERP implementation as involving the coordination of business processes, organizational structures, and human actors - highlighting the strong interdependency between technical, social, and organizational aspects.

### 3.3.2 Organizational and Socio-Technical Dynamics

To better understand the complexity associated with digital transformation and system implementation, these processes can be viewed from a digital innovation perspective. Nambisan et al. (2017) describe digital innovation as the creation of, and subsequent changes in, market offerings, business processes, or business models that result from the use of digital technology. The authors argue that a central challenge is that digital tools should not be regarded in the same way as traditional, analog tools when it comes to project boundaries and control.

An important aspect of implementing digital tools and undergoing digital transformation is that these initiatives do not have a clearly defined endpoint. Nambisan et al. (2017) describe digital tools as digital artifacts, i.e. objects with an ambivalent ontology. An example of a digital artifact is an ERP system. Digital artifacts can be shaped, modified, and further developed even after the implementation is considered complete, thereby blurring the boundary between process and outcome. Consequently, digital transformation cannot be viewed as a project with a distinct end. It should rather

be understood as an ongoing process in which the system, for example, and the organization continuously interact and influence one another.

Furthermore, another important aspect of system implementation and digital innovation is that different departments and individuals within an organization may perceive the same technology in different ways. Nambisan et al. (2017) present the concept of socio-cognitive sensemaking to describe how digital technologies are simultaneously interpreted within an individual's cognition and within the broader social system. When the implementation of, for example, an ERP system spans multiple departments and ways of working, it can be difficult to fully grasp the implementation and the changes it entails. This may lead individuals to establish their own boundaries regarding what they believe the system represents, which Nambisan et al. (2017) describe as cognitive frames. If these frames become too dominant, there is a risk that individuals fail to understand the overall scope of the implementation and the opportunities it offers, a phenomenon the authors refer to as failure to reframe. However, when individuals' different interpretations are communicated and discussed - whether between colleagues or across departments - people may instead become more open to adjusting their interpretations and broadening their frames, which can lead to a more shared and nuanced understanding of the change.

Differences in cognitive framing are not solely cognitive in nature but also involve individuals' emotional responses and evaluative judgments. Lee (2018) used scenario-based studies to examine how people perceive decisions made by algorithms compared to those made by humans, with a focus on trust, fairness, and emotional reactions. One insight from Lee (2018) is that the interpretation of, and reaction to, a technology among individuals often depends on the type of task it is intended to perform. For tasks perceived to require data-driven decision-making, people tend to respond positively to technology, viewing it as efficient and objective. However, for tasks that have traditionally required human judgment, people often perceive data-driven decisions and algorithms as less fair and less trustworthy. The article further indicates that perceptions of algorithmic decision-making are not determined solely by how technically advanced or well-functioning the technology is, but also by the psychology and perceptions of the people in the context where it is used. Furthermore, it shows that many individuals feel that algorithms used to evaluate people can be experienced as dehumanizing and

demeaning. Lee (2018) argues that these emotional reactions persist even if the algorithm is objectively effective. Additionally, algorithms influence how people perceive different jobs and tasks. Technology can thus influence the status and meaning of work, with some roles, for example, being regarded as less skilled and less socially valued.

### 3.4 Change management

Organizational change is part of a firm's effort to stay competitive in a changing environment. The purpose of organizational change tends to aim for alignment of internal identity and external forces such as technological shifts, government regulations, and market competition (Armenakis & Bedeian, 1999).

Helms Mills et al. (2009) explains organizational change as an alteration within the operation of an organization. The change is often rooted in structure, technology, culture, leadership, goals, or personnel. The change affects how members perceive information and perform. Change can be an everyday occurring phenomenon, however it is not the everyday change that has an impact on the thinking of those in charge for the organization. When discussing organizational change, it is referred to those changes that have a significant or substantial impact on the way people think about their organization (Helms Mills et al., 2009).

#### 3.4.1 Planned change

Planned change is rooted in a plan with systematic efforts initiated by members of the organization. The process of planned change is proactive and goal-oriented, unlike changes that happen to organizations unintentionally (Cummings & Worley, 2009). The scope of a planned change can vary from a small initiative such as fine-tuning of existing processes, to radical changes of the whole organization. Planned changes can be seen as a linear process. However, it can also be a dynamic process involving changing goals and unexpected events (Cummings & Worley, 2009).

Hussain et al. (2018) explains how the Kurt Lewin model - a framework for the process of planned change - can be used to analyze the forces and steps in organizational change. The three steps included in the process are unfreezing, movement (or changing), and refreezing (Hussain et al., 2018). The first step of unfreezing involves the process of breaking down the current state and preparing for change. Preparing the organization for changes involves processes that aim to increase driving forces towards

change and minimize resistance. The movement (or changing) stage is the implementation of the change where the organization changes from current state to desired future state. This step involves restructuring behaviors, attitudes, or processes of individuals or departments. The third step of refreezing aims to stabilize the organization in the new state (Hussain et al., 2018).

Kotter's eight-stage process is a framework designed for guidance within the change process to ensure smooth and permanent change (Pollack & Pollack, 2015). The process aims to shift organizational culture to ensure pursued results. The framework can be seen as a linear process, however, steps can occur simultaneously, and different groups can be located at different stages in the process (Pollack & Pollack, 2015).

The eight step of Kotter's change process from the article *Using Kotter's Eight Stage Process to Manage an Organizational Change Program: Presentation and Practice*, Pollack and Pollack (2015) are stated as following:

1. Establishing a Sense of Urgency. This step aims to create a widespread in the organization that there is a need for change. It puts effort on leaders to motivate others to put time and effort into the process. This step can be seen as the foundation to being able to gain cooperation.
2. Creating the Guiding Coalition, at this stage the organization should form groups that oversee the change. The groups should have sufficient power, credibility, and influence to be able to guide others. A change can require groups at different levels within the organization to address diverse agendas and maintain strategic alignment.
3. Develop a Vision and Strategy, those in charge of the change need to develop vision for the change and a strategy on how to reach it. This will be used to better guide others within the process.
4. Communicating the Change Vision, at this stage it is decided on what channels to use for communicating the change.
5. Empowering Broad-Based Change, this stage includes removing obstacles that hinder the change initiative. This includes changing systems that block progress, providing necessary training, and encouraging employees.

6. **Generating Short-Term Wins**, leaders should at this stage create visible and distinct success. This will result in feasibility and momentum. These wins will show that the process is heading in the right direction and sustain or increase motivation.
7. **Consolidating Gains and Producing More Change**, with the benefits from the previous step, at this stage the momentum should be used to tackle larger, more ingrained organizational issues. It is important at this stage to not declare victory and instead use the momentum to push the organization further.
8. **Anchoring New Approaches in the Culture**, the final step is to embed the changes into the organizational culture. This will ensure that the change is permanent and not temporary.

Kotter's eight step framework provides a structural sequential approach for analyzing change processes. Pollack and Pollack (2015) emphasize that different parts of a firm can be situated at different stages of the process and stages within the process can overlap.

### 3.4.2 Resistance

Resistance to change is a phenomenon that affects the change process, it can cause delay in its start, slowing its progress, or obstructing its implementation. To understand resistance, Pardo del Val and Martínez Fuentes (2003) describe it as an inner effort to avoid change and stay in current state. One of the more significant reasons for resistance towards change is the existence of deeply rooted values in the organization. Further, the article discusses that resistance can occur in two different stages, the first being the formulation stage and the second being the implementation stage (Pardo del Val & Martínez Fuentes, 2003). In the formulating stages, resistance can occur due to inability to see the future and denial of the need for change. At this stage the motivation can also decrease as the direct cost and past failures can create a pessimistic approach. A complex environment can cause a lack of creative response, as the possibility for analysis becomes difficult. As a result of the decreased creativity, obstacles can be seen as inevitable (Pardo del Val & Martínez Fuentes, 2003). During the implementation stage resistance can occur from mismatch between the change and organizational aspects such as values, culture, or differing beliefs about the problem. Inaccurate

leadership during the implementation stage can also result in resistance towards the change initiative (Pardo del Val & Martínez Fuentes, 2003).

Lapointe and Rivard (2005) discuss resistance in more detail towards changes of IT systems. Resistance should not be perceived as an static variable, it should be recognized as an dynamic variable that changes during the process. Resistance can be categorized into five dimensions, and each dimension is dynamic and changes during the process (Lapointe & Rivard, 2005). The first kind of resistance towards changes of IT systems is behavior, and it can be defined as how people act towards the change. It ranges from apathy (inaction, lack of interest) and passive resistance (delay tactics, persistence of former habits) to active resistance (voicing opposition, forming coalitions), and aggressive resistance (sabotage, rebellion). The second dimension is object and refers to what is being resisted. During the process the object can change, in the beginning it can be targeted towards system features (technical flaws, slow response times) but as the process continues it can change towards system significance (what the system represents in terms of power) or system advocates (the management or designers pushing the change). The third aspect is the subject, and it refers to which perceives the resistance. At first it can be as individuals and then develop into groups or organizations. Resistance occurs when the previous category of subject perceives threats from the change. The fourth category is threats and refers to what type of threat the subject has towards the change. IT implementation can trigger a threat to their power, professional status, economic well-being, or established work habits. The fifth and final category is initial conditions. These are factors that have been set before the change process, for example distribution of power, organizational culture, and professional social values. The common thing with all these parameters is that they change during the process, and different actions and events can influence the parameters. An example from Lapointe and Rivard (2005) is if a subject brings a technical complaint to the management and they are faced with disciplinary threats, the object of resistance will change from the IT system towards management.

## 4. Research design

In order to conduct the study, a case study approach was applied to examine and analyze a specific company's purchasing process and a specific event in the form of a business system change. Hartley (2004) argues that a case study approach is useful for exploring new or emerging processes or behaviors, as well as situations in which organizational behavior is informal. Moreover, a case study approach could also be appropriate for understanding how work tasks were carried out and what it means to those who perform it. The author provides an example illustrating how a case study approach was used to analyze attitudes and actions related to technological change in a hospital department. Furthermore, the study also included comparative elements, as two different business systems were compared to identify their impact on the purchasing process.

### 4.1 Case introduction

Jan Comstedt AB (hereinafter referred to as "Comstedt") is a distributor and wholesaler operating in the boating and sport fishing industry in the Nordic market. The company was founded in 1983 and has its headquartered in Västra Frölunda, Gothenburg, with local offices in Norway, Finland, and Denmark. Comstedt is a business-to-business (B2B) company and therefore does not sell directly to end customers, but exclusively to resellers across the Nordic region. However, service and repair services are offered to end customers at the site in Gothenburg, as well as over phone. In 2024, Comstedt reached a turnover of 125,5 million SEK. They have a broad product portfolio comprising more than 60 brands, including several well-known brands such as Humminbird, Minn Kota, Lewmar, Jabsco and Torqeedo. However, Comstedt aims to expand their portfolio further in the coming years, in line with a target of 15% annual growth. Products are sourced globally, with suppliers located in e.g. Canada, England and US. The site in Gothenburg is where the central warehouse of Comstedt is located. All orders including sales from Norway, Finland, Denmark and Sweden are shipped from this warehouse.

In 2022, Comstedt was acquired by Alliance Marine - a bigger group within the marine and boating industry. Alliance Marine has two core activities, the first one being the development of own products, mainly within safety and sea rescue equipment (Alliance Marine, n.d.). The second activity is the distribution of complete marine solutions and

services to customers. This activity is done through the subsidiary companies within the group. Furthermore, Alliance Marine provides services such as sharing product knowledge between the firms within the group. Moreover, they can also negotiate product prices by procuring larger quantities and therefore receiving lower prices. Figure 3 illustrates a map of the companies that are part of the Alliance Marine Group.



Figure 3: Map of Alliance Marine Group Affiliates (<https://www.alliancemarine.fr/en/groupe-alliance-marine.php>)

Prior to the acquisition by Alliance Marine, Comstedt used the business system Facett. This system was introduced in the 1980s and was a Disc Operating System (DOS) used for applications such as warehouse management and sales. These kinds of systems are often custom made to fit specific business needs (Lima et al., 2021). DOS systems tended to be easy to work with but showed lots of limitations for growing companies. There were also limitations for presenting statistics and sharing information (Lima et al., 2021). The system required manual input of data and did not provide any analytical tools. For warehouse management, Facett updated the current stock levels and provided the location of specific articles within the warehouse. In terms of sales activities, the system allowed the creation of customer accounts as well as the placement of orders. However, Facett did not offer automatic recommendations or indications regarding when or what goods should be purchased. Although, it could trigger a suggestion of

procurement if a certain level of products was reached. These levels needed to be set manually and did not adapt to changes in external factors.

In October 2025, Comstedt transitioned to the business system Microsoft Dynamics 365 Finance and Operations (hereinafter referred to as Dynamics) - used for resource planning and customer relationship management - as a result of the acquisition by Alliance Marine. The software has its roots in three different types of data - setup data, master data, and transaction data (Luszczak, 2023). Setup data refers to how business processes work, for example which warehouses or serial numbers of articles to be used. The master data are data regarding core business objects - for example customers, vendors, products, or employees. Transaction data is the data that is continuously collected and updated from business activities - for example sales orders, invoices, and inventory transactions (Luszczak, 2023).

Using these data types, Dynamics can perform a wide range of functional and analytical tasks (Luszczak, 2023). One function is the supply chain and inventory control, where the system can calculate the quantity and value of inventory of products at different detailed levels. Another powerful capability of the system is master planning and optimization. The system uses orders, on-hand inventory, and forecasts to calculate material and capacity requirements. It also offers an optimization tool that uses this transaction data to structure a plan for activities such as orders for production, purchasing, and transfers (Luszczak, 2023). The system allows for better workflow management as the data can be used to automate workflows, for example triggering purchase recommendations which only need approval.

In summary, Dynamics allows for an integrated solution for business activities within one environment. By using setup data, master data, and transaction data, the system can provide solutions for end-to-end supply chain and financial management. Data driven decision making also allows for automated workflows (Luszczak, 2023).

## 4.2 Mixed-method approach

The study included a combination of qualitative and quantitative data. Therefore, the chosen research design was a mixed-methods strategy, as described by Bell et al. (2022). This strategy was used to capture both the organizational and technical aspects of the business system transition, as well as its impact on the purchasing process. The

qualitative data was required to understand the full story of the system transition, including the underlying reasons, interpretations, challenges, expectations, and similar aspects, as well as to understand how the purchasing process had previously been carried out and what was perceived as working well or less well. To complement the qualitative data and instead examine the purchasing process from a more technical perspective - focusing on how it worked together with the new business system and its parameters - quantitative data was required. The qualitative and quantitative data were collected in parallel and simultaneously. The results were analyzed and compared to create an integrated whole, thus, a parallel convergent design method was applied (Bell et al., 2022).

### 4.3 Data collection

Since the study followed a mixed-methods strategy, both qualitative and quantitative data were collected. The data collection procedures for each method are presented below, with the qualitative data collection described first, followed by the quantitative data collection.

#### 4.3.1 Qualitative data

The first type of data collection was through semi-structured interviews, in which open dialogue was encouraged based on selected discussion themes. This type of interview allowed for an open discussion and conversation, providing participants with the opportunity of deeper explanation and reasoning, resulting in deeper insights and perspectives (Bell et al., 2022). By applying a purposive sampling strategy, respondents were selected based on their suitability, with the aim of obtaining as much in-depth knowledge as possible within a specific area or subject (Campbell et al., 2020). Interviews were conducted with individuals within Comstedt's organization, both individuals working directly with purchasing and individuals from other departments, such as finance, in order to capture their perspectives and reflections regarding the system transition. Furthermore, a literature review was conducted to support the study. Articles, books, and other relevant literature were retrieved from online databases such as Google Scholar and the Chalmers Library.

Table 1 presents the interviews that were conducted and outlines the respondents' roles, the themes discussed, as well as the interview duration and the date on which each interview was conducted.

*Table 1: Overview of conducted interviews*

Respondent	Role	Themes	Duration [min]	Date
A	Chief Operating Officer	<ul style="list-style-type: none"> <li>General company information</li> <li>System transition</li> <li>Acquisition</li> </ul>	45	2026-02-09
B	Product owner and Purchasing officer	<ul style="list-style-type: none"> <li>Purchasing process</li> <li>System transition</li> </ul>	42	2026-02-11
C	Product owner and Purchasing officer	<ul style="list-style-type: none"> <li>Purchasing process</li> <li>System transition</li> </ul>	37	2026-02-25
D	Warehouse and logistics manager	<ul style="list-style-type: none"> <li>System transition</li> <li>WMS</li> </ul>	50	2026-02-26
E	Sales representative	<ul style="list-style-type: none"> <li>System transition</li> </ul>	25	2026-02-27
F	Warehouse worker	<ul style="list-style-type: none"> <li>System transition</li> </ul>	29	2026-02-27

#### 4.3.2 Quantitative data

The quantitative data were collected from the two business systems - Facett and Microsoft Dynamics 365 Finance and Operations. As the data originated from the company's operations and day-to-day activities, and was therefore not primarily intended for research purposes, it could be regarded as naturally occurring data (Bell et al., 2022). The data came in reports that covered the quantity of articles sold, when it was sold and its profitability. Additionally, the data also showed inventory levels, backorders, and inventory values. All data were collected in an Excel file but to make it more intelligible, the data is presented in reports using Microsoft's data analysis and visualization tool Power BI. The reports allowed for detailed analysis of one specific product, but it could also group into categories, locations, or customers. Moreover, as stated in Section 2.3, only data from October 2024 and onwards were considered, and only data relevant to the purchasing process and inventory management was included.

To analyze quantitative data, the method of Business analytics (BA) was used. This was a method that enabled machine learning and statistical techniques. The aim of the

method was to promote efficacy and performance within the organization (Yin & Fernandez, 2020). Unlike traditional methods that provide descriptive reporting, BA has a further developed approach and provided predictive modeling and optimization techniques which gave actionable insights (Yin & Fernandez, 2020). The quantitative insights from the method could be categorized into three levels. The first level being descriptive analytics, this was when historical and current data were being used to understand trends and past performance. The second level was predictive analytics, which predicted future outcomes based on existing datasets. The third level was prescriptive analytics, and this step was more advanced and provided advice and suggestions for specific business problems using algorithms and calculations in decision making (Yin & Fernandez, 2020). BA allows companies to move away from reliance on pure experience or assumptions toward fact-based decisions by objectifying the decision-making process. BA uses techniques such as data mining, statistical modeling, and quantitative analysis (Yin & Fernandez, 2020).

The research combined the two levels of predictive and prescriptive analytics. The predictive level took data from the Power BI reports to forecast future demand. It also focused on finding potential future use of Microsoft dynamics. The prescriptive level aimed to provide suggestions for which parameters that need to be modified to make the purchasing process more data driven. To analyze quantitative data, excel was used for calculations.

## 4.4 Data analysis

Data analysis was a repetitive and comprehensive process that aimed to transfer raw data into meaningful insights (Wickham, 2016). The purpose of data analysis was to reveal the internal messages of data, while at the same time handling the complexity of the data. In this section, we will present how the report will analyze the two different types of data that have been collected.

### 4.4.1 Qualitative data analysis

To analyze the collected qualitative data, the Gioia methodology, presented by Gioia et al. (2012), was applied. This methodology provided a systematic approach to enhance the methodological rigor in inductive, qualitative research. In the context of this study, the focus was on examining how a small company was affected by a business system

change as a result of being acquired by a larger company. By using this approach, the analytical process became more transparent, credible, and defensible, as respondents' experiences and statements were combined with the researchers' theoretical interpretations through a multi-stage analysis process. A data structure (see figure 4) was used to link raw data with theoretical interpretations and emerging concepts, providing the reader with a clear overview of the analytical process and thereby strengthening its credibility (Gioia et al., 2012).

The first step of the process aimed to identify and form the terms, codes, and categories mentioned by respondents during the interviews. At this stage, the same language used by the respondents and within the organization was applied, and the researchers' own interpretations of the data are minimized. These elements constituted the analysis's first-order concepts, and according to Gioia et al. (2012), ten interviews could generate between 50 and 100 different concepts.

The next step of the process focused on logically grouping the concepts identified in the previous stage by identifying relationships, similarities, and differences among them. From this, the concepts were consolidated into more abstract groups, referred to as second-order themes. In these groups, the researchers' own terminology could be used, although the authors recommend retaining the respondents' terms.

Once the data from the first stage had been condensed into a smaller, more manageable number of second-order themes, the possibility of further consolidating and reducing these themes into second-order aggregate dimensions was examined. When all data were in place - first-order concepts as well as second-order themes and aggregate dimensions - a clear data structure could be constructed that illustrates how the process from raw data to themes and dimensions had been carried out, as in figure 2.

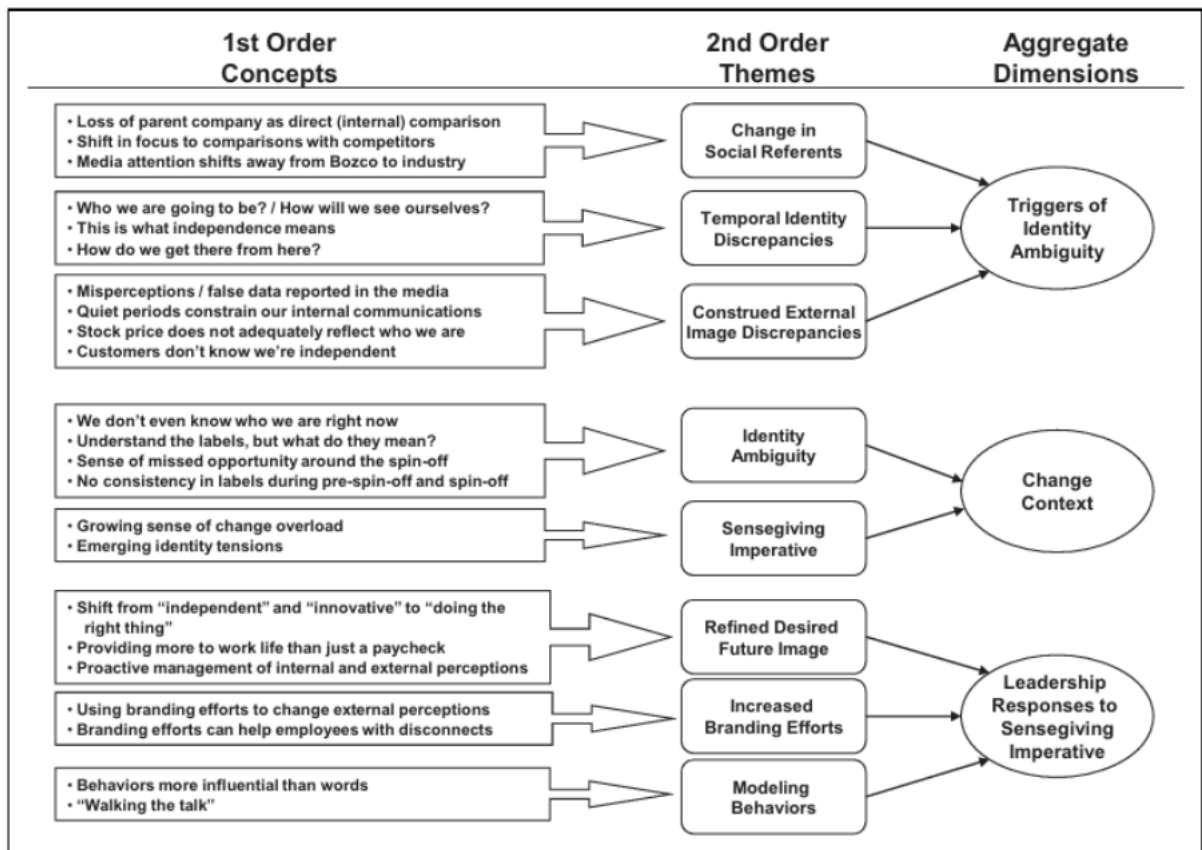


Figure 4: Data structure example

Once the data had been compiled and structured, the next step was to develop a model that illustrates the findings and conclusions that could be drawn from the data. Gioia et al. (2012) argue that the data structure itself represents a static picture of the research phenomena, and that the goal instead is to create a dynamic model grounded in the empirical data and linked to relevant theory. The model should not only present concepts, themes, and dimensions, but also illustrate the interrelationships among them (Gioia et al., 2012). An example of such a model is presented in Figure 5.

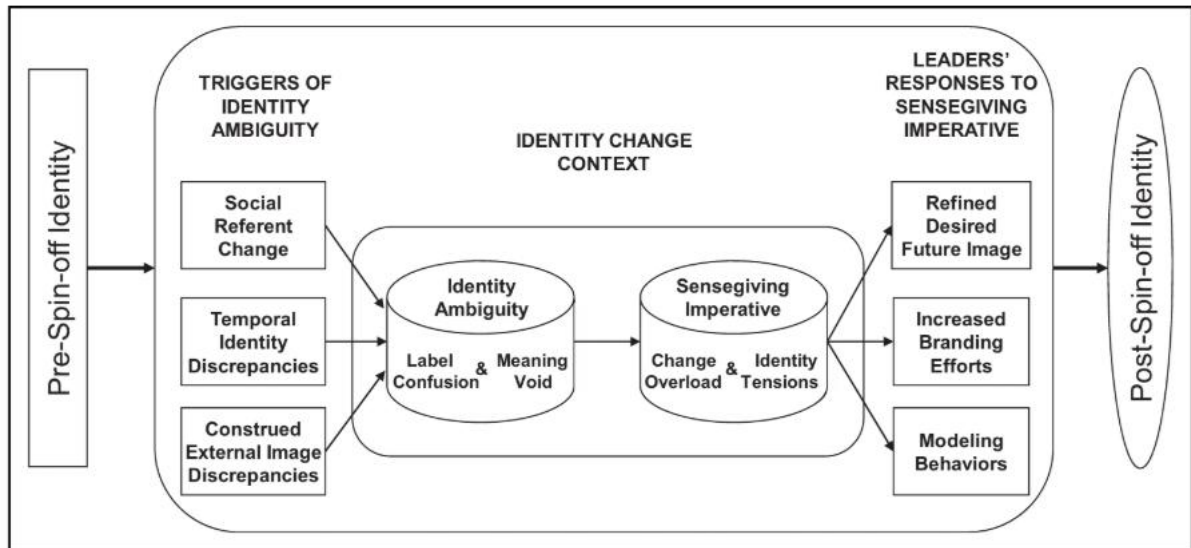


Figure 5: Example of a grounded model generated by the data structure in Figure 4

#### 4.4.2 Quantitative data analysis

Quantitative data analysis involved the use of mathematical theories to make evaluations of data. The result should be a more understandable and meaningful presentation of the data. The process of quantitative data analysis mainly used descriptive data. In order to make the data more understandable and meaningful, characterizing data by numerical counts, percentages, and measures of both central tendency and variability is useful (Taylor-Powell, 1996). The reports used as foundation came with lots of data and the methods described were used to clarify the data. The analysis of quantitative data required more than simple calculations, therefore Taylor-Powell (1996) suggests a ranking of the data. This includes finding measurements that could sequence the data or order it in another structured way to show how different data compares to other. Visual representation was another way of working with quantitative data - for example through charts, tables, and graphs. This was to understand patterns and help communicate key findings more effectively to an audience (Taylor-Powell, 1996). Ranking and visualizing the data were used as a foundation for further decision-making in the process.

When data had been collected, it often did not occur in a structured way that allowed for simple and effective analysis (Mertens et al., 2017). Therefore, the first step of the analysis process was to structure and clean the data. When structuring data, data was put into the right category and related to the correct topic. Cleaning data involved the

process of deleting invalid and unreliable information to ensure reliability and smoothening the data analysis (Mertens et al., 2017). The quantitative data were collected through company reports of the whole firm's operations. Therefore, the data had been analyzed and structured to ensure it was relevant for the research questions. To support the quantitative analysis, two Excel work sheets were conducted with the data. The two Excels were based on data extracted from the Microsoft dynamics 365 system and aimed to be a foundation for how parameters for the master planning tool need to be set up. Both Excels contained input sheets containing article information such as 12 months of previous monthly sales volumes, purchase price, lead time (in days which were converted into months in the calculations), and coefficient of variation for lead time. It was decided to include only 50 products in the Excel models, as data were not available for all products in Comstedt's assortment, and including all products would have resulted in data volumes that were too large to manage. The different products were carefully selected to provide as representative a picture of reality as possible. The chosen products were products that were still available to purchase and had been for at least 12 months. In order to reflect reality and align with the Pareto 80/20 principle, products from different segments were selected. This included products from various suppliers, products with both high and low demand across different time periods, as well as products from different price ranges and categories, such as higher-priced motors and lower-cost spare parts.

The first excel was ABC/XYZ classification. The first section of ABC classification was based on cumulative annual revenue. This was done by sorting the products in order from the largest share of the total revenue to the lowest share. Then assigned each category a percentual share of the total revenue to assign the different products to categories. Products with a high share of the revenue were categorized higher while those with lower were placed in lower categories. The XYZ classification was based on variation of monthly demand and using the coefficient of variation for classification. The Excel took the sales data from previous 12 months and calculated the coefficient of variation with the formula in Equation 6, it took the standard deviation of demand divided by the average demand.

$$CV = \sigma \div \bar{x} \quad (6)$$

$\sigma$  = Standard deviation of demand

$\bar{x}$  = Average demand

Products with low variation were put into higher tier categories while those with higher variation were put into lower tier categories. To finalize the categorization, the ABC and XYZ categorization were combined. Resulting in a final segmentation based on revenue and variation in demand. The last step for the excel was to assign a safety stock for each segment. Safety stock was calculated using the method of cycle service which is based on the formula in Equation 5 in section 3.2.4. Data regarding lead time variation was not available but the firm clearly states that the lead times varies, therefore the value of *CVLT* was a fixed value decided for each product together with the firm. All segments were assigned different service levels, which results in different values of *Z*. The variety in demand and the lead time was gathered from the input sheet for each product.

The second Excel was a forecasting tool used as a foundation for the master planning in Microsoft dynamics. It aimed to determine what type of forecasting calculation was best for each product. The excel used the two most common approaches for forecasting, moving average and exponential smoothing, which are described by Jonsson and Mattsson (2009). Each article was simulated with both methods using the previous 12 months of historical data. The results from both forecasting methods were then evaluated using MAPE with Equation 3 presented in section 3.2.1.2. The excel handled zero demand periods with the approach of excluding them in the calculation. The method with the lowest MAPE was recommended to be used for that specific article in the master planning tool.

## 4.5 Reliability and validity

To ensure high quality of the study, the aspect of reliability and validity was fundamental. This was relevant for all types of studies (Bell et al., 2022). To ensure reliability, three aspects needed to be taken into consideration; Stability, Internal reliability and Inter-rater reliability. To determine stability, it was important to consider if the measurement would be stable over time, this was to be sure that a result related to the measurement did not fluctuate. Internal reliability referred to if scales or indexes

were consistent across respondents and groups. Inter-rater reliability was when subjective judgement was needed for the study and referred to how observation or translation of subjective judgements were categorized (Bell et al., 2022). Validity for quantitative research aimed to investigate if selected measurement captured intended results. This was because quantitative data had the risk of providing inaccurate results by providing results outside of aimed context (Bell et al., 2022). Issues of causality in the studies needed to be considered to ensure validity. This could be done by analyzing if the data used as a foundation of a result was the determining factor for the result.

Noble and Smith (2015) explain how personal bias needs to be addressed to ensure reliability and validity when using a qualitative research approach. For this study, personal bias was accounted for when presenting results, to ensure reliability and validity. For example, lots of data relating to the case company were collected from employees at the company which perceived the risk of having bias, which was considered in the results.

## 5. Ethical considerations

The structure of the interviews was conducted to align with ethical considerations. The participants of the interviews were available to stay anonymous in the interviews, so they can keep integrity and confidentiality. All participants in the interviews were informed of the purpose and had the possibility of withdrawing the interview afterwards. This made participants in the interviews feel safe and allowed them to answer freely. Some questions had links to personal experiences and own thoughts. If the respondent didn't feel comfortable answering them, it was allowed to skip questions. Some interviews were recorded, but before recordings participants had to give consent to being recorded. During all interviews, notes were taken and after the project none of the notes or recordings were saved.

Additionally, real product data were used to perform calculations. However, it was agreed together with the company not to present all data in detail, as it may contain sensitive business information. This decision was made to protect the company's confidentiality while still allowing the study to be based on realistic and relevant data.

## 6. Result analysis

In this chapter, the collected data will be presented. The chapter begins with a compilation and analysis of the qualitative data gathered from the interviews, followed by a presentation and analysis of the compiled quantitative data.

### 6.1 Qualitative results

To compile and analyze the qualitative data from the interviews presented in Table 2, the Gioia methodology will be applied. The semi-structured interviews were conducted with the following individuals:

*Table 2: Role of respondents*

<b>Respondent</b>	<b>Role</b>
<b>A</b>	Chief Operating Officer
<b>B</b>	Product owner and Purchasing officer
<b>C</b>	Product owner and Purchasing officer
<b>D</b>	Warehouse and Logistics manager
<b>E</b>	Sales representative
<b>F</b>	Warehouse worker

First, Comstedt's existing situation and purchasing process are described based on the conducted interviews. At Comstedt, procurement is primarily managed by three individuals. These individuals are responsible for supplier relationships and purchasing within specific product categories, for example particular brands such as Lewmar and Torqeedo. Interviews were conducted with two of these three individuals. The interviews reveal that there is currently no standardized procurement process in place. Instead, each individual works according to their own approach.

The legacy system, Facett, did not support data-driven procurement to any significant extent, but it did allow for the use of manual triggers such as reorder levels and safety stock, which could generate procurement suggestions. Thus, there is a limited degree of data-driven input in the procurement process, but the interviews clearly indicate that qualitative methods are predominantly used. Buyers have strong knowledge of the market and their suppliers, and purchasing decisions are primarily based on this knowledge and ongoing dialogue.

When asked about how the procurement process is carried out, Respondent B explained that the first step is to review past sales data in order to gain a quick overview and initial assessment of the situation. To access these figures, data exports from Facett were used and then visualized in Power BI. After this, decisions are largely based on individual judgment and “*gut feeling*” before the purchase is ultimately made.

Both respondents view the system change as an opportunity to introduce greater structure into procurement and achieve more accurate purchasing planning. They argue that with MS Dynamics, multiple parameters can be configured for different products and time periods, potentially resulting in more accurate forecasts. However, the respondents also emphasize that thorough preparation is required and that significant changes and improvements are still needed for a more data-driven procurement process to become feasible. In particular, they highlight that the data underlying forecasting models must be clean and accurate, which is currently not the case - for example, regarding lead times and goods in transit. The respondents also stress that the sales department needs to be more actively involved in the procurement process. Respondents B and C notes, for instance, that sales personnel must clearly distinguish between recurring orders and one-off orders, so that these are not mixed in forecasting models and result in forecasts that do not accurately reflect reality.

Furthermore, Table 3 presents the full data structure derived from the interviews and provides an overview of the analytical process. The interviews generated 66 first-order concepts based on the respondents’ own expressions and formulations. These were then grouped into 21 second-order themes, and further consolidated into 5 broader and more general aggregate dimensions. The 5 dimensions, which are explained in more detail later, are: Experience of the Previous System & Limitations, System Transition: Change Process & Implementation, Organisational & Process Change, Data Quality, Complexity & Decision-Making, and Perceptions of Outcomes and Future Potential.

Table 3: Data structure of the qualitative analysis

<b>Aggregate dimension 1: Experience of Facett &amp; Limitations</b>		
<b>1st-Order Concepts</b>	<b>2nd-Order Themes</b>	<b>Aggregate Dimension</b>
DOS-based, no search functionality (Respondents A, B, D)	Technical constraints of legacy system	<b>Experience of the Previous System &amp; Limitations</b>
Had to navigate manually to find old orders (Respondents E & F)		
Customised but limited - text files as registers (Respondent A)		
Required learning codes to navigate - not learnable in an afternoon (Respondent D)		
Everything was manual - picking lists and checks (Respondent D)	High manual workload and error risk	
No real traceability in the warehouse (Respondents D & F)		
Facett had its charm but was not optimal (F)		
DHL packages could end up in PostNord - system didn't stop you (Respondent F)		
Power BI built on top to compensate for gaps (Respondent A & B)	System flexibility vs. scalability trade-off	
Easy to change - just call the developer (Respondent B and D)		
Risky to depend on a single support person (Respondent A)		
<b>Aggregate dimension 2: System Transition: Change Process &amp; Implementation</b>		
<b>1st-Order Concepts</b>	<b>2nd-Order Themes</b>	<b>Aggregate Dimension</b>
Decision came from Alliance - not our choice (Respondent A, B & D)	Top-down, externally driven decision	<b>System Transition: Change Process &amp; Implementation</b>
Just had to adapt and adjust our way of working (Respondent B)		
Information came gradually, not in one announcement (Respondent D)	Informal and gradual communication of change	
Told in passing - "we will probably switch" (Respondent D)		
It was clear from day one I started - had been ongoing (Respondent E)		
We challenged the choice by evaluating an alternative WMS (Respondent D)	Limited but present employee influence	
Could discuss, but no veto (Respondent D)		
Switching from Facett has been an ongoing topic since 2014 (Respondent B)	Long anticipation of change	

Everyone had been waiting for the transition (Respondent B)		
System kept changing throughout - hard to test (Respondent B)	Moving target during implementation	
No one had full knowledge - everyone learned along the way (Respondent B)		
Mix of fear and fascination when system went live (Respondent A)	Emotional response	
Development environment did not reflect live system (Respondent A)		
New is always difficult, but you learn as you go (Respondent F)		
Training was mostly learning-by-doing and trial-and-error (Respondents A, B & D)	Insufficient formal training	
Internal group resources helped implement - then self-taught (Respondent A)		
Very little training - a few sessions then own responsibility (Respondent E)		
Language barrier in complex discussions (Respondent D)	Operational complexity and integration gaps	
Hard to adapt to our very dynamic and fast order flows (Respondent D)		
Integrations from webshop to warehouse to workshop - difficult (Respondent D)		
Often felt loss of control - many middlemen in the chain (Respondent D)	Dependency and loss of control	
Core model for many companies makes changes slower (Respondent D)		
<b>Aggregate dimension 3: Organisational &amp; Process Change</b>		
<b>1st-Order Concepts</b>	<b>2nd-Order Themes</b>	<b>Aggregate Dimension</b>
Warehouse became more autonomous with new system (Respondent B)	Shifting roles and departmental autonomy	<b>Organisational &amp; Process Change</b>
Earlier easy to help out in warehouse, now requires scanners (Respondent B)		
Bigger responsibility - setting demands on development (Respondent B)		
More dialogue and discussion between departments (Respondent A)	Increased cross-functional communication	

Better understanding between finance, purchasing and sales (Respondent A)		
Previously more separated, now more interwoven (Respondents A & B)		
Now more dependent on Respondent A and Respondent D for Dynamics issues (Respondent F)		
For shipments outside EU we need proformas created in Dynamics (Respondent F)		
Inbound receiving now scanned directly into system (Respondent D)	Process automation and standardisation	
New hires easier to onboard with a “standard” system (Respondent D)		
Every step visible - who did what and when (Respondents D & F)		

#### Aggregate dimension 4: Data Quality, Complexity & Decision-Making

1st-Order Concept	2nd-Order Themes	Aggregate Dimension
Goods-in-transit not counted in purchasing base - triggers system re-orders (Respondents A, B, C, D & E)	Data accuracy and system limitations	Data Quality, Complexity & Decision-Making
Generalised lead times lead to wrong decisions (Respondent A)		
Data exported each night - not real-time (Respondent B)		
Incoming goods and expected delivery dates rarely match reality (Respondent E)		
Far more data than before – from 40 to 180 product attributes (Respondent A)	Increased data complexity	
Hard to know which data to use and how to interpret it (Respondent A & C)		
Need to choose which data should drive decisions (Respondent A)		
Now possible to build real forecasts - beyond historical sales (Respondent B & C)	Potential for data-driven purchasing	
Sales team must flag unique vs. recurring orders for forecasting (Respondent B)		
Transaction history and logs available for traceability (Respondent A)		

#### Aggregate dimension 5: Perceptions of Outcome & Future Potential

1st-Order Concepts	2nd-Order Themes	Aggregate Dimension
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Overall, the transition has been handled relatively well (Respondent B)	Cautiously positive overall assessment	Perceptions of Outcome & Future Potential
Successful - we met our goals and learned a lot (Respondent A)		
Good in principle, but was long and extensive (Respondents A, B & D)		
Takes more time and energy than expected (Respondent B)	Transition harder than anticipated	
Frustrating things always happen along the way (Respondent B)		
One is never fully finished - always continued development (Respondent A & C)		
System is still overwhelming - learning every day (Respondent E)		
Better inventory planning and purchasing structure possible (Respondent B)	Unrealized system potential	
System does nothing automatically - users must drive it (Respondent A)		
Would be interesting to calculate the ROI of the transition (Respondent D)		
Lots of functions in the system I don't actively use (Respondent E)		
Future looks promising once fully settled in (Respondent E)		

To complement the data structure presented above and clarify how the different dimensions are interconnected and interact, a grounded model has been developed in accordance with the Gioia methodology. Figure 6 illustrates how the transition can be understood as an ongoing socio-technical reconfiguration of work practices, decision-making, and interdepartmental relationships - where the value of the system depends on continuous learning, refinement, adaptation, and configuration.

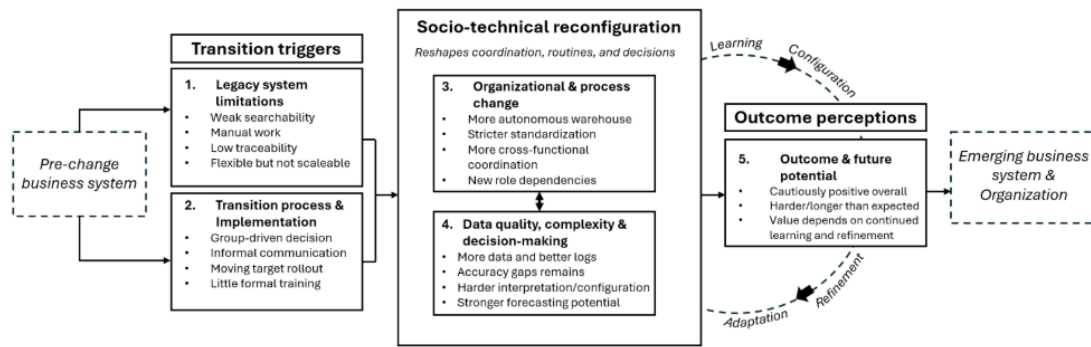


Figure 6: Grounded model of the qualitative results

### 6.1.1 Dimension 1: Experience of the Previous System & Limitations

The first aggregate dimension, Experience of the Previous System & Limitations, aims to understand how respondents perceived the legacy business system. Across all interviews, the system was described as deeply embedded in the organization’s daily routines and ways of working, having been continuously developed over time in response to emerging operational needs. However, it also became clear during the interviews that the system could no longer meet the company’s evolving requirements, and that discussions about replacing it had been ongoing for a considerable period of time.

A major technical drawback highlighted by the respondents was the system’s DOS-based architecture, which lacked search functionality and was difficult to navigate - particularly for users without prior experience. Respondent B described the system as follows:

---

*“It was DOS-based, so if you wanted to find something, you really had to search for it. There was no search function. If you wanted to look at an old order, you had to create a new order for that customer just to access the order history.”*

---

Respondent A further explains that the system’s underlying data structure made it difficult to retrieve historical information unless one knew exactly what to search for. To overcome this limitation and gain access to visualized and structured data, the company developed Power BI integrations that extracted data from the system and

updated it on an hourly basis. This illustrates how the company had to build additional solutions around the system and work around its limitations, rather than being able to use the system in the way they intended. Furthermore, Respondent A explains that, in recent years, the system had become highly customized to the organization's operations, and that Comstedt frequently contacted the system developer to request new functionalities. The respondent describes this dependence on the expertise of a single individual as a risk, since further development and support relied heavily on that person's responsibility.

Regarding warehouse management, the system's limitations were primarily operational rather than informational. Respondent D describes how the system could not always be used in the intended way - for example, when products were nominally assigned to a specific storage location in the system but were in reality distributed across several locations in the warehouse. This complicated picking activities, particularly since picking was performed based on printed lists without any confirmation that the correct item had been picked. Respondent D described the situation as follows:

---

*“For example, you did not always have a clear overview of where items were actually located. A product could be registered in the system as being stored at a specific location, but in reality only a few items were there, while the rest might be on a buffer pallet, on the floor, or somewhere else entirely. In other words, there was no real traceability. There was also a lot of manual work. Picking lists were printed and checked off manually, which meant there was a significant risk of human error.”*

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Based on the interviews, a certain difference in perceptions and experiences of the legacy system can be identified. It is evident that Respondents E and F have a somewhat different perspective compared to the others. The respondents describe that the system functioned well once one had learned how to use it, and they argue that it was fast and felt professional to work with. These differences in perception may be explained by the fact that respondents E and F have not worked at Comstedt for as long as the other respondents and were less involved in the system change process. They may also be related to their roles and responsibilities within the organization, as well as the ways in which they used the legacy system in their daily work.

## 6.1.2 Dimension 2: System Transition: Change Process & Implementation

The second aggregate dimension, System Transition: Change Process & Implementation, covers how the decision to change systems was made and how it was communicated within the company. Furthermore, the dimension also addresses how the change process unfolded and how it was perceived from different roles within the company. Based on the interviews, we can see that the initiative behind the system change primarily appears to have stemmed from the acquisition. Respondent B states the following:

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*“It was not our decision to choose the system. Alliance Marine decided that all companies would switch together. We just had to adapt and try to adjust our way of working.”*

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Respondent A is along the same lines but argues that the decision was also their own, since they had recognized the limitations of the old system. Respondent A states the following:

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*“We had long been talking about how we had built ourselves into a complex network where further development had become difficult. The system could not be expanded in a sustainable way, and operational reliability was not sufficient.” ... “The decision came both from ourselves and from the group, which felt that it was time to switch. Other companies in the group had already moved to Dynamics, and the expertise was available in-house. There were discussions about other systems, but they would not have worked as well for intercompany flows or production.”*

---

Respondent D argues that they did have influence over the choice of system, though in this case referring to the choice of WMS system. The respondent explains that planning was paused for a period in order to investigate an alternative system. However, this initiative did not lead anywhere, and eventually the final decision was made at group level.

The system change was communicated in an informal and relaxed manner. Respondent D says that he heard about the decision *“in passing,”* rather than in a more formal

context. Respondent E, who started working at the company after the decision had been made, on the other hand describes the situation as “*crystal clear,*” which does not align with the picture given by the other respondents.

As for the implementation itself, it lasted for approximately two years, with a formal go-live in November 2025. A recurring view among the respondents is that it was difficult to familiarize themselves with and understand the system during the testing period because it was constantly changing and being updated. Respondent B states the following:

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*“The problem is that it is difficult to test when the system is not fully built - it kept changing all the time.”*

---

Respondent A adds that the system environment used for testing did not reflect reality, which contributed to problems arising once the system was in place. Small configuration settings could create major problems once the system began working with real data.

Regarding preparation and training in the system, the respondents claim that this was very limited. Respondents A and D describe how they had to learn through “*learning by doing,*” with support from manuals and resources within the group. Respondent E says that there were a few joint practice sessions within the company, but that after that it was largely a matter of exploring and learning on one’s own. Respondent E also says that they had to help each other a great deal, and that respondent A was the main person they turned to when they encountered problems, stating the following:

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*“Sometimes you were left a bit stuck if Respondent A didn’t have time right then.”*

---

Overall, the implementation can be described as a learning process, where it was largely up to each individual to explore and learn the new system. The most evident problems and obstacles encountered were technical and related to integrations between different functions and departments, as well as Comstedt’s complex order fulfillment

requirements. Respondents also stated that it was sometimes difficult to understand error messages because they were written in French.

### 6.1.3 Dimension 3: Organisational & Process Change

The third aggregate dimension aims to map how the system change has affected the company's ways of working, how roles have changed, and how collaboration between departments has evolved. The most significant change has taken place in the warehouse, where printed paper picking lists have been replaced by barcode scanners. Respondent B argues that the warehouse is now more independent than before, stating the following:

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*“The warehouse is more independent now. They work in a different system that we have not focused on learning. Previously, it was easier to step in and help, since everything was based on printed picking lists.”*

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In this sense, the warehouse has moved further away from the rest of the business following the system change. On the other hand, processes are now stricter and accuracy is higher, since it is more difficult to make mistakes because the system provides warnings. Respondent F describes his main tasks as being roughly the same as before, but says that the way that they are performed has become more precise and that it is more comfortable because the risk of making mistakes is lower. For example, the following was stated:

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*“DHL parcels were sometimes placed in the PostNord cage before - you can't really do that now, because the system stops you. That felt good.”*

---

Respondent D describes how his role has changed as a result of the system change. He was heavily involved in the implementation, particularly with regard to the warehouse, and has therefore become the company's expert in the WMS - the person people turn to when they have questions. At a cross-functional level, Respondent A explains that the system change has increased collaboration and dialogue between departments. This is partly because the system itself has brought departments closer together, but also

because of the joint preparatory work and the experience of learning something new together within the company. For example, the respondent stated the following:

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*“It has created more dialogue and discussions. It has also led to a better understanding between finance, purchasing, and sales. Previously, the departments were more separated; now we work in a more integrated way.”*

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Respondent F also noted that the departments have become more dependent on one another, although in a somewhat more negative sense. The respondent argues that problems sometimes arise in the warehouse that cannot be resolved without assistance from office staff. Here, the respondent gives the example of shipments outside the EU, where it is necessary for Respondent A or D to create pro forma invoices in Dynamics. Respondent F believes that this kind of interdependence was not as common when the old system was still in use.

#### 6.1.4 Dimension 4: Data Quality, Complexity & Decision-Making

The fourth aggregate dimension addresses how the transition has changed the availability, quality, and usability of data for operational and purchasing decision-making. The system change from the old Facett system to MS Dynamics 365 contributed to a major expansion in the amount of available information and data. According to Respondent A, the number of product attributes increased from approximately 40 to 180, while the new system also generates transaction data, full audit trails, and logs of historical financial and inventory data. This type of data either did not exist in the old system or was difficult to access. Respondent A argues that traceability has improved significantly in the new system, stating the following:

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*“Logs are important for troubleshooting. In the old system, errors could occur without being able to see why. Now there is almost always an explanation, because the system logs so much.”*

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However, according to Respondent A, the major increase in data has also contributed to greater complexity. The large volume of data has made it more difficult to know which data should be used as a basis for decision-making, as well as how it should be

interpreted. A large part of the configuration of the new system was carried out without knowing exactly how and what would be affected, or what downstream consequences might arise. This means there is a risk that misconfigured or incorrect master data may create problems further down the chain through automated workflows.

The most significant data-related issue, mentioned by three respondents in different roles and from different departments, concerns how goods in transit are handled in the system. Respondent B explains that problems arise when a shipment is in transit between its origin and Comstedt's warehouse. During this period, the items are not included in MS Dynamics' master planning base, which causes the system to show a stock deficit that does not reflect reality. This, in turn, leads the system to generate purchasing recommendations for items that are already on their way, because the system assumes they are unavailable during the transit period. Respondent B states the following:

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*“When the supplier ships the goods, they are not included in the system's purchasing basis because they are located in another warehouse. The system then believes that we are missing the item and wants to purchase it again.”*

---

Respondent E describes the same issue from a sales perspective. The respondent explains that in-transit stock is not visible on the company's website and is not included in the system's expected delivery data, which means that customers cannot see that products are on their way. This makes it difficult for the respondent to update customers on expected delivery dates.

Respondent F describes a problem that sometimes occurs as a consequence of the goods-in-transit issue described above. The respondent explains that the system sometimes instructs staff to pick a certain quantity from a specific bin location, but that the quantity to be picked does not always correspond to what is actually available in the bin.

In the interview with Respondent A, additional data-related problems were discussed. Here, the respondent mentions that generalized lead times for product segments are a challenge for the company. Lead times that are set generically for product categories

rather than precisely for individual items result in the system failing to reflect reality. This makes it difficult to assess demand accurately and may also lead to costly overstocking or shortages. During the interviews, it was also noted that issues arise when orders are postponed due to, for example, stockouts. This results in demand appearing to occur at a later point in time than it actually did.

Despite the data-related problems described, the respondents express optimism and believe that there is considerable potential for making more data-driven decisions. Respondent B argues that the new system now makes it possible to produce forecasts based on more than just historical sales data, which was not possible in the old system. However, the respondent also emphasizes that this requires the sales department to be more involved in the purchasing process, for example by marking unique orders in the system - such as a large one-time order for a specific customer - so that they are not treated as recurring, since this distorts the forecasting model:

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*“The salespeople need to become more engaged in the forecasting process. They need to indicate whether an order is unique or recurring; otherwise, it affects the forecasts incorrectly.”*

---

In the interview with Respondent E, this gap is further reinforced, as he argues that sales staff are currently not formally involved in the purchasing process:

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*“We are asked how many units we think we will be able to sell per year, but there is not really any formal process for that.”*

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#### 6.1.5 Dimension 5: Perceptions of Outcome and Future Potential

The fifth and final dimension captures how the respondents assess the overall outcome of the transition and what future potential they believe the system holds. Across all interviews, the system change appears to have been viewed as cautiously positive, with Respondent A’s summary being the most direct affirmation:

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*“It has been successful. We achieved our goals and have learned a great deal.”*

---

Respondent B’s assessment was similarly positive, but the respondent also argues that the process took longer and required more energy than initially expected. Respondent D suggests that the change was a good idea in principle, but that it took longer than it should have. The respondent was also uncertain about the degree of group-level benefit as long as the subsidiary companies within Alliance Marine continue to operate largely independently. Respondent D also mentions that a return on investment calculation should be carried out for the system change. All respondents express that the system transition is not yet fully complete. Respondent A states the following:

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*“The system is operational and functioning, but further development and improvements will always continue.”*

---

Respondent B confirms that there is still a great deal of untapped potential in the purchasing planning and forecasting tools, and Respondent A argues that there is room to make greater use of workflow automation and deeper integrations. Respondent E believes that there are still many features in the system that are not yet being utilized in his role as a sales representative.

## 6.2 Quantitative results

In this chapter, the quantitative data collected through the business systems and data reports from Power BI are presented and summarized. Excel was used as the tool for compiling and analyzing the data. This chapter will present the different parameters that need to be configured and set up in Microsoft Dynamics master planning tool, as well as the data that was described in the interviews as inaccurate and problematic. Furthermore, this section outlines how the data was processed and analyzed using ABC classification and forecasting models.

### 6.2.1 Key parameters in Dynamics

When using the business analytical method aiming to set up a data driven purchasing process in Microsoft dynamics, it was found that some parameters need to be set up

manually. Excel was used to calculate different scenarios of the setup of parameters and to provide suggestions for how Comstedt should configure these parameters. A key finding was that forecasting and safety stock are key parameters within Dynamics master planning tool. For the forecasting tool, different formulas for calculating the final demand forecast were needed to be determined manually. Further, the safety stock needed to be set to an exact number of units.

### 6.2.1.1 Forecasting

In this section the findings from the quantitative data regarding forecasting will be presented. Simulations of different forecasting methods provided guidance in line with the third step of the business analytics method of giving clear suggestions for improvement. The two different forecasting methods of moving average and exponential smoothing were used. Each method was evaluated using MAPE, which were explained in section 5.2.1.2. The MAPE results indicate which forecasting method should be applied to each product in order to achieve the most accurate forecast possible. Table 4 shows the distribution of products between the two methods.

*Table 4: Forecast distribution and MAPE results*

	Moving Average	Exponential Smoothing
<b>Number of products</b>	29	21
<b>Mean MAPE</b>	94,56%	99,03%

The forecasting simulation revealed that 29 out of the 50 products were recommended to use the moving average method, while exponential smoothing should be applied to the remaining 21 products. The results were based on what product had the lowest MAPE for each method. The absolute MAPE for each method, which indicates the overall accuracy, resulted in 94.56% for moving average and 99.03% for exponential smoothing. This indicates very poor performance for both methods. Therefore, these results need careful consideration before being used as a foundation in the master planning tool.

MAPE values near 100% indicates that the forecast models on average deviates nearly a full magnitude compared to the actual demand. This would be alarming in a low-variety environment and maybe useless. However, this is not the case for Comstedt,

instead these results should be combined with the XYZ classification. Out of 50 products, 48 products are classified as Z-class. Meaning that they have a coefficient of variation exceeding 0,50 and can be considered to have unpredictable demand pattern. For products with this high demand uncertainty, using well specified forecasting methods can still produce high errors, and achieving low MAPE might not be possible using these methods without longer historical data series or additional explanatory variables such as seasonality index.

Furthermore, the underlying data used in the forecasting models carries inaccuracies which affects the high variation in demand. Unfulfilled demand in a certain period is carried over to the next period, where it is recorded as regular demand. Also, one-off orders are not identified as non-recurring orders which affects the historical baseline for the forecast. It is therefore possible that the high MAPE of the two forecasting methods and the large quantity of products in the Z-class reflects the data quality. By adjusting the data so the demand is placed in the right period even if a stockout occurs and to mark one-off orders so that they are not part of the forecast calculation would make the data reflect reality better, which in turn could lower MAPE and the coefficient of variation without changes of the forecasting method.

#### 6.2.1.2 ABC/XYZ classification

To support a more data driven purchasing process, an ABC/XYZ classification was conducted. In the selection process, 50 items from Comstedt's product range were carefully selected to follow the theory for classification and the Pareto principle presented in Section 5.2.4. The ABC classification is based on demand value (Demand  $\times$  Product Value). All products are sorted in cumulative order from highest share of revenue to lowest share of revenue. For each class, parameters were set, where the A-class stood for 80%, the B-class for 80-95%, and the C-class for the remaining 5% of the total revenue. As shown in Table 5, nine articles, corresponding to 18% of the total number of articles, account for 79.8% of total revenue. The B-class contains 12 products and accounts for 14.8% of total revenue, while the remaining 29 articles are placed in C-class and account for 5.4% of total revenue.

Table 5: ABC classification

Class	Products	Revenue	Cumulative share
<b>A</b>	9	26,325,927 SEK	79.8%
<b>B</b>	12	4,893,053 SEK	14.8%
<b>C</b>	29	1,773,867 SEK	5.4%

The XYZ classifications are based on the demand variability which is described in section 5.2.4. The reasoning for these classifications is related to financial motives and warehouse space restrictions. Assigning the same service level to a product with high demand variability as to one with low variability would result in excessively high safety stock levels for the more variable product. The classification is set as the following: X has  $CV \leq 0.20$ , stable demand, Y has  $0.20 < CV \leq 0.50$ , moderate variation, and Z has  $CV > 0.50$ , high variation and low predictability. The distribution of products can be seen in Table 6.

Table 6: XYZ classification

Class	Products
<b>X</b>	0
<b>Y</b>	2
<b>Z</b>	48

The final classification is a 3×3 matrix in which the products are divided into different segments based on the ABC classification in Table 5 and the XYZ classification in Table 6. The results are presented in Table 7.

Table 7: ABC/XYZ classification

	X	Y	Z
A	0	1	8
B	0	1	11
C	0	0	29

As can be observed, the distribution is highly uneven. The absence of X-items indicates that none of the selected products showed sufficiently stable demand to be categorized as low-variability items based on the chosen parameters. This suggests that Comstedt's assortment - at least within the examined sample - is characterized by fluctuating and intermittent demand rather than smooth and continuous demand. Although, given the

context - a wholesale company operating in a highly seasonal industry with a significant number of one-off orders, as well as misleading demand and lead time data - this distribution is not unreasonable. The fact that a majority of the products are classified as CZ indicates that a large portion of the assortment consists of items with low revenue contribution and high demand variability. From a planning perspective, these products are challenging and should not be managed in the same way as A-items. This further reinforces the importance of product segmentation. Furthermore, the presence of several AZ and BZ items is particularly significant. These products combine medium to high revenue importance with volatile demand. As such, they should be considered critical, as misjudgments regarding these items can lead to both financial and service-related consequences.

### 6.2.1.3 Safety stock

The safety stock for each product is based on a determined service level for each class, which were decided upon together with the firm. The classification are shown in Table 8.

Table 8: Service level for safety stock

ABC/XYZ	X	Y	Z
A	95%	95%	90%
B	93%	92%	88%
C	90%	88%	80%

The result for the safety stock is presented in Table 9 with a total value of stock on hand following the service level parameters.

Table 9: Safety stock results

Article	Class	Number of units	Value
1	CZ	4	9 004 SEK
2	CZ	20	15 000 SEK
3	AZ	31	213 280 SEK
4	CZ	1	1 170 SEK
5	CZ	37	20 646 SEK
6	CZ	25	950 SEK
7	CZ	22	5 720 SEK
8	CZ	1	16 347 SEK
9	CZ	3	804 SEK

10	CZ	2	11 700 SEK
11	BZ	59	94 400 SEK
12	CZ	10	8 500 SEK
13	CZ	8	9 128 SEK
14	CZ	15	2 145 SEK
15	CZ	3	1 563 SEK
16	BZ	51	121 788 SEK
17	BZ	4	42 160 SEK
18	CZ	6	11 460 SEK
19	CZ	4	4 364 SEK
20	CZ	2	13 320 SEK
21	AZ	17	190 774 SEK
22	CZ	2	2 748 SEK
23	AY	23	220 248 SEK
24	CZ	2	2 538 SEK
25	CZ	28	31 920 SEK
26	CZ	2	1 244 SEK
27	CZ	40	7 480 SEK
28	BZ	3	87 900 SEK
29	BY	45	45 900 SEK
30	CZ	4	324 SEK
31	BZ	10	40 100 SEK
32	AZ	183	559 980 SEK
33	AZ	95	1 610 250 SEK
34	BZ	3	65 211 SEK
35	AZ	172	328 520 SEK
36	BZ	12	22 920 SEK
37	AZ	31	489 025 SEK
38	AZ	75	100 050 SEK
39	CZ	13	20 306 SEK
40	CZ	25	9 450 SEK
41	CZ	2	2 232 SEK
42	BZ	51	58 344 SEK
43	BZ	51	121 788 SEK
44	BZ	32	71 616 SEK
45	CZ	1	24 244 SEK
46	CZ	4	956 SEK
47	AZ	6	97 872 SEK
48	CZ	2	2 376 SEK
49	CZ	3	1 857 SEK

50	BZ	5	52 100 SEK
<b>Total</b>		<b>1 250</b>	<b>4 873 710 SEK</b>

The service levels ranges from 95% for AX products, down to 80% for CZ products. This method prioritizes capital investments where it generates the most value by assigning products that contributes the most to revenue and have a more stable demand with a higher service level.

As shown in the result, no products were assigned X-class and only two Y-class and the remaining 48 products were placed in Z-class. The distribution between the XYZ classes collapses as there is close to no differentiation. The result is more of an ABC classification rather than a full ABC/XYZ matrix. The outcome is that all products are treated as high variability items, which comes with a risk. The safety stock levels can be inaccurate depending on if the Z-classification reflects the actual volatility or if it is affected by the quality of the data.

### 6.2.2 Inaccurate data

When reviewing the Power BI reports, several indications were found that the data may be inaccurate or misleading and therefore may not provide an accurate reflection of reality. For example, the Power BI reports shows when an item is being shipped, but not when the actual request of the product occurred. If there is a request for a product in the first period but there is a stockout and the product is being shipped in the second period the reports show that there is a demand in the second period, but in reality the demand should be placed in the first period. As seen in Table 10 below, it was no demand in period M8, but a demand for 165 products in period M9. This does not reflect the reality as there actually was a demand for 70 products in M8 and 95 products in M9, which was identified by further investigation of the order dates. Due to the stockout in M8, the delivery was moved to M9. This example is one of many similar ones, and was also raised as an issue by the respondents during the interviews.

Table 10: Item demand with stockout Item demand with stockout

M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
7	4	85	100	52	76	100	0	165	25	56	27

Moreover, if a product is out of stock, orders can still be placed as backorders. However, some customers are unwilling to wait and therefore choose not to place an order. For certain products, stockouts occur without any system in place to capture lost sales or unmet demand. As a result, the recorded demand for out-of-stock products is underestimated and does not accurately reflect the true market demand.

Additionally, some orders are one-offs, meaning that a customer puts an order that does not follow the regular demand and therefore should not be included in the forecast calculations. As shown in Table 11 below, in period M9 there was a demand for 180 products, but other months has lower or no demand. The reason for this is that one customer ordered a large quantity once, but this is not a common order. These one-off orders can influence the forecasting and indicate a higher upcoming demand than there actually is. This issue was also raised during the interviews with the purchasing managers.

Table 11: Item demand with one-off orders

M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
15	0	0	0	25	0	0	0	180	0	0	0

In the Power BI reports, the lead time for the majority of the products is set with 30-day intervals, meaning that the products have 30, 60, 90 or 120 days lead time. This results in a high variety in lead time, which does not reflect the reality. If this value is used in forecasting calculations, it may give a misleading picture and result in inaccurate forecasts. This issue was reinforced in the interviews, where it was raised repeatedly as a recurring problem. The lead times seem to be based on rough estimates of how long the process should take, drawing on the buyers' experience.

## 7. Discussion

This chapter aims to examine the key findings through the lens of the theoretical framework. Observations were structured into for topics; data quality as a barrier to data-driven purchasing, the limits of quantitative forecasting in a high-variability assortment, the role of segmentation, and ERP implementation as an ongoing organizational transformation. Together these themes highlight the possibility of a data driven purchasing process, but it requires both an organizational and technical journey.

### 7.1 Data Quality as a Barrier to a Data-Driven Purchasing Process

Both the quantitative and the qualitative findings indicates that the data quality is a primary restriction in the process of implementing a more data-driven purchasing process at Comstedt. The simulation of the two forecasting methods of exponential smoothing and moving average resulted in a MAPE of 94.56% for moving average and 99.03% for exponential smoothing. These results indicate that neither of the two methods are suitable as a foundation for Comstedts forecasting. However, these results cannot be evaluated alone without consideration to the quality of data. Data were inaccurate as it did not take stockout, lost sales, one-off orders and the roughly estimated lead-times into consideration, which affects the final MAPE results for the two methods. These inaccuracies are supported by all respondents in the interviews and from the quantitative analysis.

The finding that data quality is a barrier for a data-driven purchasing process is in line with the theory from Petropoulos et al. (2022), who states that forecasting is rooted in the assumption that the historical data reflects the underlying demand patterns. This assumption does not reflect the reality at Comstedt and results in poor performance of the forecast. Bandyal et al. (2016) states that lead time variability should be considered as an internal risk that needs to be considered in decision areas including time and place utility, responsiveness, and safety stocks. During the interview with Respondent A, it was clearly stated that the lead times are very generalised. This is also a barrier that results in poor performance of the forecast, as well as inaccuracies of safety stock and purchasing recommendations. The consequence for Comstedt in this study is that the safety stock carries uncertainties. Although the calculations are rooted in Jonsson and

Mattsson's (2009) cycle service formula the result is affected by data quality. Before the master planning tool in Microsoft dynamics is used it is a necessity rather than a suggestion to improve the data quality. A suggestion for Comstedt would be to use Jonsson and Mattsson's (2009) method of the sales management approach, as this strategy can work as a middle ground between quantitative and qualitative forecasting. Using this approach, people with market knowledge collectively review available data and produce a shared forecast. This could be a temporary solution before the data quality has been ensured. The approach of combining quantitative and qualitative forecasting methods is somewhat used already at Comstedt. Respondent B stated that the output from the system should not be used as a direct foundation for decisions, it should be treated as a first guidance to be reviewed and adjusted. This type of forecasting can be further developed by involving additional stakeholders in the process and collaboratively developing a shared forecast.

## 7.2 The Limits of Quantitative Forecasting in a High-Variability Assortment

The ABC/XYZ analysis shows that segmentation is highly relevant for Comstedt. However, it also indicates that the company's assortment is too volatile to support uniform planning rules. The ABC results closely follow the Pareto logic: 9 items, representing 18% of the sample, account for 79.8% of total revenue, while 29 C-items account for only 5.4%. This strongly supports the use of differentiated management attention, service levels, and replenishment strategies. However, the XYZ results are more problematic: 48 out of 50 items were classified as Z-items, only 2 as Y-items, and none as X-items. In practice, this suggests that the variability dimension collapses and provides limited discrimination between products. It becomes clear that segmentation based on economic importance remains useful, whereas segmentation based on demand stability is weakened due to both actual demand volatility and data-related issues.

From a theoretical perspective, the results are in line with Teunter et al. (2010) and Flores and Whybark (1987), who argue that prioritization is necessary, as not all products should be managed in the same way. There are also connections to Ronen (1983) and Jonsson and Mattsson (2009), who link service levels and safety stock to strategic trade-offs between availability and inventory costs.

However, this study, in the context of Comstedt, provides an important insight: classification systems are only as meaningful as the variability data on which they rely. When nearly the entire assortment is classified as Z, the model risks overstating unpredictability and encouraging overly cautious planning. This becomes particularly significant given that the safety stock calculation resulted in a total of 1,250 units, with an estimated value of nearly 5 million SEK for the analyzed sample. Such a capital commitment may be justified for critical AZ and BZ items, but becomes problematic if the underlying variability is exaggerated due to poor demand and lead-time data. It would be valuable to examine how the results might differ if the data used in the calculations more accurately reflected reality.

### 7.3 The Role of Segmentation

The qualitative findings regarding the purchasing process reveals that it is based more on individual judgment and experience rather than a structured analytical processes. It was also revealed that each purchasing manager work with their own approach and there was no formalised procurement process in place. This reflects how Carter and Narasimhan (1996) describes the historical perception of the role of purchasing as a tactical, administrative function rather than a strategic function.

The transition to Microsoft dynamics allows for a transition towards a more strategic purchasing process, as described by Porter (1999). The new system especially allows for step five of the process of using data and step seven of developing an indirect sourcing approach. The ABC/XYZ classification is a foundation for step three in the purchasing process of “Segmentation and Prioritize”. However, the ABC/XYZ classification does not capture the strategic dimension of items in the segmentation. The Kraljic matrix (Kraljic, 1983) offers a dimension of strategic segmentation to items based on the dimensions of profit impact and supply risk. This also aligns closely with the statement by Germain and Dröge (1990), who notes that lead time variability should be considered a risk that needs to be considered. Combining these two dimensions of segmentation would allow Comstedt to further tailor their sourcing strategy. For example, by applying competitive bidding to leverage items while forming longer-term partnerships for strategic items with high supply risk. This can be useful as Comstedt sources globally from suppliers in Canada, England and US. Supply risks were discussed with the respondents as an issue for the firm, and a standalone ABC/XYZ

classification with demand-based classification does not capture this risk. For Comstedt, the segmentation can be used to guide differentiated control, however due to the inaccuracies of data discussed earlier, parameters and values should be continuously updated as the quality of data improves.

## 7.4 ERP Implementation as an Ongoing Organizational Transformation

The qualitative findings indicate that the system change has already, since its introduction in the autumn of 2025, affected and transformed how work is organized at Comstedt, even though the new routines have not yet been fully stabilized. The new system has made the warehouse more autonomous, increased traceability, standardized activities, and improved communication and collaboration between departments. Respondents also described improved visibility regarding who performed specific tasks and when, easier onboarding of new employees, and a more integrated way of working compared to the legacy system. These findings align with Davenport (1998) and Katuu (2020), who describe ERP systems as tools for integration and standardization across functions.

At the same time, the system change has also redistributed dependency and uncertainty. Respondents described the implementation as top-down and externally driven, with limited employee influence, gradual communication, an unclear end goal, and insufficient formal training, where learning primarily occurred through trial-and-error. Some respondents also mentioned language barriers, integration challenges, and a perceived loss of control. These findings are consistent with Celestin and Vanitha (2015), Pollack and Pollack (2015), and Hussain et al. (2018), all of whom emphasize the importance of communication, training, and user involvement for successful change initiatives. The differing perceptions and interpretations of the system further align with Nambisan et al.'s (2017) observation that individuals and departments construct their own cognitive frames around new digital technologies, shaping how the system's potential is perceived and utilized. In the case of Comstedt, it is clear that the organization has entered the "change" stage but has not yet fully reached the "refreezing" stage according to Lewin's model, as routines, responsibilities, and interpretations are still evolving.

However, an interesting aspect that adds nuance to the theory is that the limited communication, training, and employee influence did not result in a significant level of overt resistance. This is something that might have been expected given the literature on change management and resistance. Instead, employees generally accepted the change, although with a certain degree of skepticism. One possible explanation is that the legacy system was perceived as outdated and insufficient, which may have outweighed potential resistance to the implementation of the new system - despite shortcomings in the implementation process.

Overall, respondents expressed the impression that the system change has been successful, but that it remains unfinished in practice. This aligns with Nambisan et al.'s (2017) statement that digital technologies should be understood as ongoing artifacts rather than closed projects. There are also connections to Lapointe and Rivard's (2005) view of resistance as a dynamic phenomenon. In Comstedt's case, resistance does not primarily manifest as open rejection, but rather as uncertainty, dependency, and selective trust in the new system.

## 7.5 Converging perspectives on a data-driven purchasing process

Overall, the findings from Sections 7.1 to 7.4 point to a common theme: the gap between the potential of a data-driven purchasing process and the organizational, technical, and contextual conditions required to realize it. While the previous sections have focused on specific dimensions of this topic, it is valuable to take a step back and reflect on the broader picture.

From a technical perspective, the transition to Microsoft Dynamics represents a significant opportunity and a substantial upgrade in capability. The legacy system offered limited analytical functionality and required manual workarounds and custom integrations to function effectively. With Microsoft Dynamics, Comstedt now has access to a broader ecosystem, including integrated tools and functionalities such as master planning tools, forecasting models, and workflow automation. The quantitative analysis in this study demonstrates that the tools and frameworks required to support a more data-driven purchasing process - such as ABC/XYZ classification, safety stock calculations, and forecasting models - are not only theoretically applicable but can also

be operationalized using the available data. In this sense, a technical foundation exists, both in terms of data and the capabilities offered by Microsoft Dynamics, to further develop the purchasing process at Comstedt.

However, focusing solely on the technical perspective overlooks the complexity involved, including not only technical challenges but also organizational and contextual factors. The qualitative findings show that the system change has been perceived differently across roles and departments - as discussed in Section 7.4 regarding cognitive framing and the differences in interpretation identified by Nambisan et al. (2017). In the case of Comstedt, this implies that the challenge is not only technical but also organizational - requiring the development of a shared understanding of the system change, its purpose, and its implications for different roles and departments.

There is also a strategic dimension to consider. The quantitative results indicate that purchasing at Comstedt has largely been based on individual experience, without a standardized or formalized process or strong cross-functional collaboration. Following the acquisition by Alliance Marine and the company's integration into a larger international group, there is now an expectation of more standardized processes and group-level reporting. The study shows that the system change is not merely a technical upgrade, but part of a broader transformation. The purchasing function's shift from a largely administrative and tactical role toward a more strategic and central function within the organization has begun, which is in line with the development of purchasing discussed by Nambisan et al. (2017).

It is also relevant to reflect on the generalizability of this study and what the findings may imply for similar organizations undergoing comparable transitions. Comstedt is a relatively small wholesaler with a broad and highly seasonal product assortment, international business relationships, and historically limited technical maturity due to reliance on an outdated legacy system. These characteristics are not unique, nor are the challenges identified in the study - such as data quality issues, high demand variability, and limited or informal training. This study illustrates how these challenges interact in practice and how they reinforce one another. Data quality issues lead to forecasting errors, which in turn undermine classification systems, thereby reducing trust in inventory management decisions and purchasing recommendations. The implication is that these issues cannot be addressed in isolation but require a coordinated approach.

Improving lead time accuracy requires organizational discipline, achieving more accurate demand data requires closer collaboration between departments to identify and manage one-off orders, and stabilizing demand records requires a shared approach to handling the impact of stockouts on historical data. Collectively, improvements such as these form the necessary preconditions for establishing a functioning data-driven purchasing process.

## 8. Conclusion

The motive of this study has been to examine the possibility of implementing a more data driven purchasing process at Comstedt, during a transition to Microsoft Dynamics. The study is a mixed approach with both qualitative interviews and quantitative findings that reveals challenges and opportunities during the transition. The research is based on six interviews across different roles and departments and a quantitative analysis of 50 products within Comstedts assortment. The combination these two sets aimed to analyze and provide a generalised picture of both the technical aspects but also the reality of the organization in the context of implementing a data driven purchasing process at a small wholesale company undergoing a system change. On the subject for the first research question:

*RQ1: How can a more data-driven purchasing process can be designed at Comstedt in the context of a transition to Microsoft Dynamics 365 Finance and Operations?*

The study reveals that the technical foundation exists for such a process. However, there are several obstacles that needs to be addressed before this process can be implemented and run smoothly. The quantitative findings show the possibility of using ABC/XYZ classification, safety stock calculations based on cycle service levels, and forecasting simulations using moving average and exponential smoothing are all possible to use in the current environment. The result also reveals that that the quality of the data used as foundation for all calculations lacks quality and therefor significantly limits the reliability of these tools. MAPE where used to analyse the accuracy of the forecasting and resulted in 94.56% for moving average and 99.03% for exponential smoothing, and for the XYZ classification 48 out of 50 products were categorized in category Z. These results highlights that there is an unstable volatile demand for the items, but it also highlights that there is systematic corrupted data. The data quality is affected by misplaced demand caused by stockouts, not tagging one-off orders, and the generalized lead times set by 30-days interval. The final answer to the first research question is therefor that a data driven purchasing process can be designed using frameworks analyzed in this study, and the new system of Microsoft Dynamics supports with the required technical infrastructure. Although Comstedt has the required data and technical infrastructure this process cannot be fully implemented, therefor a hybrid approach is recommended at the early stages. The hybrid approach uses quantitative

outputs from the system as a first guidance rather than a direct foundation for a decision. The quantitative output is then being reversed using structured qualitative judgement in line with the sales management approach of involving the purchasing managers and adjusting the forecast.

The study also suggests for improvements outside of the data-specific improvements. Kraljic matrix offers a further strategic dimension to complement the ABC/XYZ classification. The ABC/XYZ classification is based on revenue contribution and demand variability, but Kraljic matrix adds a dimension of supply risk which is especially important to Comstedt as they source products globally from countries such as Canada, England and US. Future application of the Kraljic matrix could allow for suggestions on strategies how to source with different levels of risks, applying competitive bidding to leverage items while building longer-term partnerships for strategic items with high supply risk. This would allow Comstedt to create a sourcing strategy more closely with the actual risk of their assortment. While Microsoft Dynamics can handle the inventory planning problems it does not take the strategic level of items into consideration. By applying this strategic step would help Comstedt in their journey to broader develop the purchasing process as a strategic function.

Furthermore, regarding the second research question:

*RQ2: How do employee perceptions of a new ERP system implementation influence the development of data-driven purchasing processes?*

The findings show that employee perceptions play a central role in determining how effectively the new system can support the development of a more data-driven purchasing process. It provides Comstedt with access to more detailed product and transaction data, improved traceability, more standardized workflows, and the possibility of using forecasting, segmentation, safety stock calculations, and master planning in a more systematic manner. However, these possibilities do not automatically lead to a higher degree of data-driven decision-making. Instead, the findings show that the system's utilization also depends on how employees understand, trust, interpret, and use the system in their daily work.

A first important aspect is that employees' perceptions of the new system are strongly influenced by their experiences of the legacy system. Facett, the legacy system, was

described as deeply embedded in daily routines, but also as outdated, manual, difficult to scale, and limited in terms of searchability, traceability, and analytical functionality. From this perspective, it is understandable that the system transition was generally perceived as necessary, even though it was also described as demanding. This helps explain why the transition was met with a relatively low level of resistance, despite being characterized as largely top-down, externally driven, and supported by limited formal training. Since employees had already recognized the shortcomings of the legacy system, the transition was not viewed as an unnecessary disruption but rather as an important step toward modernizing the company. In this sense, employee perceptions created a fundamental willingness to accept the new system, which constitutes an important precondition for the development of a more data-driven purchasing process.

At the same time, the implementation process created uncertainties that influence how the new system is used. The transition was described as complex, time-consuming, and not yet fully stabilized. Respondents explained that training primarily consisted of learning by doing and trial and error, supported by manuals, colleagues, and resources available within the group. One respondent described the system as a “moving target” during the implementation phase, as it continued to evolve throughout the testing period and because the test environment did not fully reflect operational reality. In addition, respondents mentioned language barriers, integration issues, and a perceived loss of control. These perceptions do not necessarily prevent employees from using the new system, but they do influence how comfortable users feel working with it and the degree of trust they place in it. When users do not feel fully comfortable with the system or believe that they have not yet mastered it, they are less likely to rely on its outputs as a basis for decision-making.

This is particularly important in relation to purchasing decisions, where trust in system-generated information is essential. Compared with the legacy system, the new system provides more detailed information, enabling the use of the models and tools applied in this study, such as forecasting and segmentation. However, as discussed throughout the study, the usefulness of these outputs is highly dependent on the quality of the underlying data. If employees perceive that the data does not accurately reflect reality,

there is a risk that they will continue to rely on intuition and experience when making decisions.

Overall, the employees expressed cautious optimism. They viewed the transition as necessary and acknowledged its potential benefits, but the new routines are still evolving, and employees are still learning how to use the system in their daily work. The ERP implementation should therefore be understood as an ongoing organizational transformation rather than a completed technical project. In conclusion, employee perceptions act as a bridge between the system's technical capabilities and its actual use in purchasing activities. Positive perceptions of the need for change support system adoption, whereas uncertainty, limited training, and data quality issues hinder employees from fully trusting and utilizing system-generated recommendations.

## 9. Further research

This study has aimed to develop an understanding of how a data driven purchasing process could be implemented at a small wholesale company undergoing a business transition. The study has had some boundaries and limitations and therefore the subject could benefit from some future research within the topic.

One main limitation in the study was the data quality. The quantitative results were based on poor quality data that was affected by misplaced demand due to stockouts, untagged one-off orders, and generalized lead times. A natural next step would be to run similar simulation with accurate data, as this could reveal a true outcome of forecasting accuracy and how ABC/XYZ classification results differ when the underlying data more accurately reflects reality, and whether the near-universal Z-classification observed in this study persists or collapses into a more differentiated distribution.

As presented in the report the segmentation on revenue and demand variability collapses, as 48 out of 50 products landed in Z-class. The method of clustering would be an interesting comparison to the current method of segmentation. Clustering could group items with similarity into groups based on multiple variables.

This study uses moving average and exponential smoothing for forecasting calculations. These are two common methods but very simple and does not take trend or seasonality into account. Given Comstedts industry with clear seasonality and volatile demand further research with seasonality, trend and more complex forecasting methods. Comparing the performance of other forecasting methods with the current used in this study would be a valuable contribution to both theory and practice.

Another area of study would be to further investigate the strategic dimension of purchasing. This study applied segmentation using ABC/XYZ classification, but as discussed in the conclusion the Kraljic matrix would add a strategic dimension. A study that reveals the outcome of Kraljic matrix at Comstedt would provide further guidance for purchasing becoming a strategic function rather than an administrative task.

Finally, this is a single case-study which limits the generalizability of the study. Therefore, applying similar mixed method approach to different firms size firms undergoing an ERP transition would help increase the generalisability of the study.

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# Appendix 1: Interview guide used in the data collection

## Interview Guide - System transition effects & data-driven purchasing

### 1. Introduction

- Can you describe your role at Comstedt and your main responsibilities?
- How long have you been working at Comstedt?
- In what ways are you involved in purchasing, planning, inventory, or system-related work?
- How would you describe your experience with the old system (Facett) before the transition?

### 2. The Situation Before the System Transition (Facett)

- Can you describe how purchasing decisions were typically made before the system change?
- What kind of information did you rely on when deciding what and when to purchase?
- What worked well with Facett in your daily work?
- What limitations or frustrations did you experience with the old system?
- How did the old system affect collaboration or information sharing across functions (e.g., sales, warehouse, finance)?

### 3. Drivers and Expectations Behind the System Change

- How was the decision to change business system communicated to you?
- What were your initial reactions to the transition to Microsoft Dynamics 365?
- What expectations did you personally have of the new system?
- In your view, what problems was the new system expected to solve?
- How did the acquisition by Alliance Marine influence the system transition?

### 4. Experience of the System Transition

- Can you describe your experience of the transition period itself?
- What were the biggest challenges during implementation and early use?
- How did the transition affect your daily work tasks?
- Were there moments when you felt uncertain or lacked control? Can you describe them?
- What kind of support or training did you receive, and how sufficient was it?

### 5. Changes in Purchasing and Planning Practices

- How has the purchasing process changed since the introduction of Microsoft Dynamics 365?
- What decisions are now more data-driven compared to before?
- Are there still decisions that rely mainly on experience or intuition? Why?

- How do you work with forecasts, reorder points, or planning parameters today?
- What parameters require manual setup, and how confident do you feel setting them?

#### **6. Impact and use of data**

- How has access to data changed with the new system?
- What types of data are most useful for your role today?
- Has the new system changed how confident you feel in purchasing decisions?
- Do you feel that the system supports proactive rather than reactive purchasing?
- Are there situations where the data does not reflect reality? Can you give examples?

#### **7. Organizational and Cultural Effects**

- Has the system transition affected collaboration between departments?
- Do you feel roles or responsibilities have changed because of the new system?
- How would you describe the company's readiness (beredskap) for digital, data-driven ways of working?
- Have attitudes toward technology or change shifted within the organization?

#### **8. Potential and Remaining Challenges**

- What potential do you see in Microsoft Dynamics 365 that is not yet realized?
- What needs to be improved for the purchasing process to work optimally?
- What risks do you see if the system is not configured or used correctly?
- If you could change one thing about the current setup, what would it be?

#### **9. Closing Reflections**

- Is there anything about the system transition that we haven't discussed but that you think is important?
- If you were to summarize the system transition in a few words or phrases, what would that be?

## Appendix 2: Sales data used in sample

Article	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
1	1	1	1	1	8	8	5	0	3	2	1	0
2	10	5	5	48	31	27	41	37	24	9	17	7
3	24	6	22	23	17	0	0	2	1	0	0	54
4	0	1	1	1	1	0	2	0	1	1	0	0
5	6	0	35	37	65	32	65	26	41	0	0	24
6	0	10	9	55	2	10	27	1	2	0	10	16
7	23	6	21	37	26	20	14	44	6	13	30	7
8	0	0	0	0	1	1	0	1	1	0	0	1
9	2	1	3	4	2	6	2	5	3	0	1	1
10	0	2	1	1	1	1	0	2	2	2	0	1
11	2	5	12	44	83	101	58	65	67	34	14	12
12	1	0	3	1	6	3	24	8	4	4	5	0
13	6	1	10	7	4	13	10	11	14	5	5	0
14	16	21	19	51	124	77	65	27	44	64	0	14
15	2	1	1	5	10	7	2	6	3	1	1	1
16	0	56	2	59	9	12	6	12	5	3	8	2
17	0	1	0	1	2	3	6	2	4	2	2	3
18	3	0	10	0	10	9	12	0	9	6	3	3
19	3	0	11	5	4	6	9	5	7	1	1	2
20	0	0	1	0	0	1	0	3	0	0	0	0
21	17	11	5	22	19	7	25	2	2	21	7	21
22	0	1	1	2	2	0	3	0	0	1	2	0
23	9	20	12	25	23	25	18	12	11	29	35	16
24	0	0	0	1	1	2	1	1	3	0	2	1
25	0	42	36	66	0	0	0	0	1	0	0	0
26	0	4	1	4	2	6	4	0	0	0	0	1
27	11	0	52	15	49	20	27	17	31	13	14	6
28	1	2	1	0	0	2	2	4	0	0	0	1
29	11	44	26	53	64	54	66	55	56	73	51	36
30	0	1	5	4	5	4	15	2	2	2	5	5
31	5	1	4	7	13	5	10	9	17	5	2	16
32	0	0	1	39	90	239	77	33	84	23	9	3

<b>33</b>	7	4	85	100	52	76	100	0	165	25	56	27
<b>34</b>	1	0	2	0	5	3	0	0	2	0	0	0
<b>35</b>	19	12	158	249	163	251	209	115	182	59	84	24
<b>36</b>	2	2	23	10	12	8	20	9	6	13	12	8
<b>37</b>	3	2	9	9	28	56	25	28	20	11	0	0
<b>38</b>	5	2	14	93	84	97	76	77	101	49	35	15
<b>39</b>	1	0	0	6	19	10	7	21	6	4	9	33
<b>40</b>	1	0	1	7	30	12	34	47	23	4	5	0
<b>41</b>	1	0	2	0	1	0	2	0	0	1	0	0
<b>42</b>	0	2	29	62	43	62	57	43	43	26	21	7
<b>43</b>	0	56	2	59	9	12	6	12	5	3	8	2
<b>44</b>	4	0	4	53	4	7	9	25	9	3	16	17
<b>45</b>	0	0	0	0	0	1	0	1	0	0	0	0
<b>46</b>	0	1	0	0	2	2	3	5	7	5	12	0
<b>47</b>	2	0	2	4	0	0	8	5	11	12	6	1
<b>48</b>	0	0	4	3	0	9	9	1	1	1	1	1
<b>49</b>	3	1	3	0	2	2	7	1	1	0	0	0
<b>50</b>	0	0	3	9	0	5	6	0	0	3	3	2

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