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EXPLORING THE IMPORTANCE OF DEMAND FORECASTING IN B2B

Enhancing the overall customer experience and operational efficiency by utilizing forecasting and collaboration at a manufacturing company

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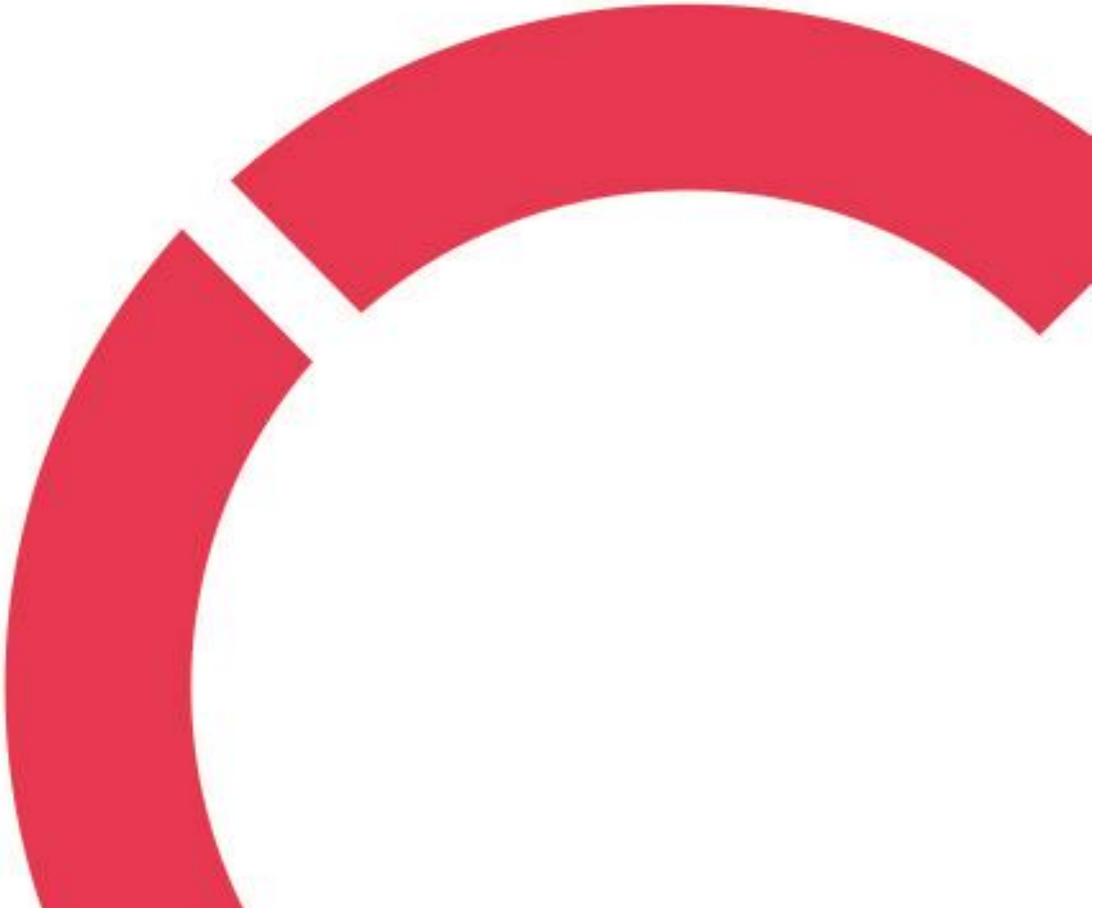

ABSTRACT

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Name of thesis EXPLORING THE IMPORTANCE OF DEMAND FORECASTING IN B2B Enhancing the overall customer experience and operational efficiency by utilizing forecasting and collaboration at a manufacturing company.		
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Being able to foresee the future is considered the ultimate goal for a company. Planning, strategies, and operations are being laid out and implemented by companies in order to anticipate what is coming, tackle the unexpected, and figure out day-to-day actions. A high percentage of these activities and functions are based upon assumptions for the future. The purpose of this thesis was to find out how different departments of a manufacturing company can benefit in terms of operational efficiency, inventory optimization, and greater customer experience levels by leveling up their knowledge of the future demand for their products and, as a result of that, make better, more calculated, and more thoughtful decisions in numerous areas inside the company. The commissioner of this thesis was a manufacturer in the bicycle plastic parts industry.

For the purposes of this thesis, it is consequential to investigate the importance of demand forecasting in B2B and to draw conclusions on their impact from the customer and organizational perspective. A qualitative study was implemented in the form of semi-constructed interviews. The interviews were conducted with manufacturing companies' top executives from different departments to establish variety and relativity. With this research-based thesis, the study used primary data from the interviews to support its arguments, drew conclusions, and raised discussions and implications that emerged from the qualitative results.

Furthermore, the theory behind demand forecasting helped to reach foundational information that was used to raise further awareness of what forecasting is, supporting and linking that theory to the research with a deductive approach. The study combined the theoretical framework with real-world data, resulting in nuanced insights into the dynamics of demand forecasting and, more precisely, into customer-generated forecasts. The results showed that the demand forecasting role in a manufacturing company plays a pivotal role when it comes to aiding strategic decisions, and if collaboration with a customer's demand is in place, then it strengthens the experience further. The findings also showed that monitoring the customer demand forecast is vital for ensuring its consistent accuracy, partnered with information flow interchange between the supplier and the buyer.

Keywords
B2B, bottom-up forecasting, benefits, collaboration, cooperation, customer, demand forecasting, function, incorporation, integration, mutual, process, relationship

CONCEPT DEFINITIONS

APAC	Asia-Pacific
ARIMA	Autoregressive Integrated Moving Average
B2B	Business to Business
B2C	Business to Consumer
BI	Business Intelligence
BOM	Bill Of Materials
CRM	Customer Relationship Management
DSI	Demand/Supply Integration
KPIs	Key Performance Indicators
Ltd	Limited Company
OEM	Original Equipment Manufacturer
SKU	Stock Keeping Unit
S&OP	Sales and Operations Planning

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1 INTRODUCTION

To explain the importance of forecasting in straightforward terms, one can compare it to taking an umbrella when the weather forecast predicts rain. You are practically shielding yourself from getting wet; that is how great the importance of forecasting is. Knowing the market or what the goal will be and deciding to achieve it is not substantial enough to make informed and somewhat more calculated decisions toward that goal. A forecast of demand is a prediction of how much, quantity-wise, a company will need in that period of time, factoring in certain assumptions. Usually, the period is monthly and even weekly in strenuous periods where demand accuracy is paramount. That is what drove this thesis to argue about the importance of demand forecasting. The context, contents, and depths of demand run deep but play a very significant, supportive, and rather primary role in nearly all company operational works, planning, and strategizing. It can be argued that if a company can master the data that can be derived from numerous sources to create a foresight of the future as accurately as possible, then the company will no longer step on unknown grounds. It will minimize the unforeseeable events of the future, make decision-making less stressful, with fewer surprises, and not rely solely on hope or ungrounded assumptions and beliefs.

In this thesis paper, a theoretical framework will be presented that targets the contents of the research that will follow afterward and raises awareness of what demand forecasting is and is not. That said, the theory behind demand forecasting that will be laid out will give a broader understanding to the reader of what forecasting is and what its role is in B2B, then specifically diving deeper into its integration and outside sources and setting the groundwork for the rest of this research-based thesis. Moreover, the theory frames the rigorous process of demand forecasting implementation and explores the market intelligence it provides by means of collaborations. To some extent, it will point out the research problems this thesis will tackle, such as uncertainty, minimal supplier-buyer relationship, lack of co-growth and co-development, and uninformed decision-making by not having a demand forecast in place. The research problems will lay the foundations for developing the research questions and, further, the interview questions. Ultimately, the theory, as a result, will also be utilized to establish the themes of the interviews for further analysis.

The research questions and scope of the arguments will be focused on exploring the importance of demand forecasting and its effect on the customer experience a customer could have with a manufacturing company when initiating a demand forecasting strategy. The interview questions, although semi-

constructed, will allow both parties to discuss the benefits from the customer's and organization's perspective when the implementation of a demand forecast is set in its daily and not-so-daily operations. In more elaboration, the approach to the research problem is from the customer's side as to how they can benefit from that function or process. However, mutual benefits for both parties will be sought since both are needed for a successful forecast. The main research questions that the research will answer are how the overall demand forecasting function or notion is perceived by the decision-making persons in a manufacturing company and how demand forecasting at a manufacturing company is mutually beneficial for the customer and the company. Consequently, this thesis is attempting to establish the fact that demand forecasting is essential for a manufacturing company in order to strategize effectively and being adequately informed for efficient decision making while simultaneously nurturing customer relationships by valuing their intelligence input.

The commissioner of this thesis is a leading company in the bike parts manufacturing industry with a long history of product innovation and a reputation for high quality. As their demand grows, so does their need to respond to that and supply their parts and components with minimal interference. The company has been established for more than sixty years and has come in remarkable ways to accomplish an excellent market share, and this thesis will help them define and implement a collaborative tool that can be used in many ways to achieve an even more outstanding market share and partnerships with the big players in the bike industry.

2 THE ROLE OF DEMAND FORECASTING IN B2B

Both sales and demand forecasting are forecasting functions aimed for and utilized in different areas but are interrelated and often used together to achieve greater accuracy and thus extract the best of benefits from forecasting. In the world of business, forecasting is frequently connected to estimating client demand or product sales. While estimating sales and demand is undoubtedly a function of forecasting, forecasting also entails projecting a much more comprehensive range of challenges (Sanders 2015, 12).

Most businesses are realizing now that one crucial strategy for success is to successfully manage the supply chain leverage, from sourcing raw materials to delivering the finalized product or service to the end consumer, as well as all of the many support services along the route. Nevertheless, properly managing a supply chain is practically impossible without a clear understanding of demand, which is the penultimate role of forecasting. (Mentzer, Moon & Mentzer 2004, 310.)

2.1 A specific difference between sales and demand forecasting

Generally, there is a distinct difference between sales and demand forecasting, which must be mentioned to determine their place in forecasting. As it is described further by Mentzer et al. (2004), sales forecasting is merely an attempt to forecast demand, and its purpose is to make projections on demands. From that, it is derived that demand forecasting is a much broader term and withholds a more comprehensive range of factors for predictions. In contrast, sales forecasting focuses specifically on future sales that a company foresees will have. Chambers (2021) further points out that sales forecasting is there to forecast revenue and sales, while demand forecasting supports demand planning with insightful data and analytics to make these sales a reality.

Sales forecasting management is concerned with overseeing the organization's sales forecasting function. One wants to know what the customers want so that they can get ready to achieve sales that are near the projected level; even though the activity is often referred to as sales forecasting, it is trying to forecast demand. Sales forecasting requires the appropriate use of various methodologies within the context of corporate information systems to adequately address the diverse needs of the consumers of

the sales forecast and to manage the entire process efficiently. It is essential to comprehend the organizational frameworks within which sales forecasting must function to address these complex issues. (Mentzer et al. 2004, 19-20.)

2.2 Demand forecasting and its use

The organizational structure, business philosophy, company culture, and level of senior management support for forecasting are evolving as the market becomes more dynamic and business people become more conscious of the value of forecasting in decision-making. As a result, the forecasting environment is evolving. Corporate culture, the business environment, how forecasting is seen by the general public, how forecasters work, how forecasts are used, and technology are all changing. Moreover, it is worth mentioning that businesses have been using forecasting since their existence but have never called it as such. Businesses and organizations are running on budgets, which, at their core, are forecasted available estimates of the future. A production plan is set, which is also based on assumptions of the future. Nowadays, organizations and businesses are naming it and utilizing forecasting processes as their beacon to better decision-making throughout. (Jain 2003, 3.)

Suppose an absolute definition were to be given as to what demand forecasting is. In that case, Moon's (2018) straightforward definition is that demand forecasting is a company's best estimate of its demand in the future as to how it will be, given a set of assumptions. Adding the word sales in the front means that we are predicting the demand of sales, which at its core is demand forecasting, as described before in the previous sub-chapter. Moon (2018) goes on to explain that forecasting, in general, is a management process. Like any other management process, it needs to be carefully structured, with attention to the individuals, procedures, and tools that make up forecasting management.

2.2.1 Demand forecasting definition breakdown

To further elaborate on the definition given by Moon (2018), a breakdown of the definition is needed of what demand forecasting is and what it is not. Firstly, a forecast is mainly a guess but an educated one; however, it does not change the fact that a guess is often wrong. Secondly, the best estimate of future demand has underneath it a large set of assumptions that can be explicitly stated or completely

assumed, and they can be external or internal. As a rule, it is best if these internal and external assumptions are explicitly specified. Thirdly, a forecast is not a plan; forecasts come first, then plans follow. In other words, plans and decisions on what to do should be grounded on realistic assessments of opportunities for the future (forecasts). Lastly, demand forecasting pertains that demand is what could be bought by the customers grounded on availability from the supplier. (Moon 2018, 84-86.)

In addition to that definition, Feigin (2011, 15-19) gives his own argument of clarification of what forecasting is, what it entails, and how it is perceived as a low-priority function. A demand forecast answers various questions that start with how much a product or a service is going to be sold, produced, and stored and what workforce is needed. A process like this would yield then a better understanding of what the future would look like. Feigin (2011, 15-16) continues on to relate demand planning with forecasting, which Sanders (2015, 7) would disagree with since it is argued that forecasting differs from planning and that forecasting comes before planning starts. However, what Feigin (2011, 17) explains is that the planning creates a statement about the projected demand and is preferential in that it is unbiased and with no constraints to it. This unconstrained forecast is the initial step in the planning of the supply chain and should not be an assertion of what a company must produce or buy but rather a mean demand at an estimated point in time (Feigin 2011, 17-18).

2.2.2 Principles in forecasting utilization

A forecast is nothing more than a projection of what might occur under a variety of plausible assumptions, one of which might be the continuation of current trends. Even inadvertently foreseeing outcomes allows firms to earn some time to get ready for whatever may unfold. This will also mean creating more than one projection because the future could take any one of a variety of paths, and each one might necessitate a different response. (Tashman, Sglavo & Gilliland 2016, 89.)

Tashman et al. (2016, 91-94) listed six principles (TABLE 1) for forecasters, and even managers can use them as a forecast blueprint for good forecasting manifestation. The first principle is mastering the purpose of a forecast. The purpose of a forecast is to drive decision-making (and not project an outcome) that comprises of a forecast to be right on time and not too late, to be reliable and not perfectly accurate, to be functionally aligned, and lastly, to be cost-effective. The second principle is mastering the timeline of a forecast. This basically includes answering the two questions of how far ahead someone needs to forecast and in what frequency. Regarding longevity, it depends on how fast it takes to

make a decision, and regarding frequency, it depends on the volatility of the environment around an industry. The third principle is mastering the forecast modelling, which includes selecting the methodology of the forecast that is needed for an organization, and that depends on various variables such as company type, customer base, and industry, but most of the time, combining methodologies is the best way. As the fourth principle, mastering monitoring the forecasts over time is vital for their reliability. The fifth principle incorporates the fact of mastering the risk consideration of a forecast and that a forecast could be wrong. The sixth and last principle is learning the process of a forecast, which describes the forecast as a rigorous, collaborative, and performance-management process that produces good results. (Tashman et al. 2016, 91-94.)

TABLE 1. Six principles of forecasting to steer a business (Adapted from Tashman et al. 2016, 91-94)

1. Mastering the purpose	Separating and refining the difference between when one thinks will be and when one wants to be. The former is a forecast the latter is a target or a goal. Timely, actionable, reliable, aligned and cost-effective are some of the qualities of a good forecast.
2. Mastering the Time	The time horizon of a forecast is closely related to how long time an action or decision is needed to be taken and in terms of frequency it depends on how quickly the micro- and macro-environment change.
3. Mastering the Models	Choosing appropriately the methodologies of forecast implementation. Two broadly used are quantitative and qualitative that themselves include a wide range of models.
4. Mastering the Monitoring	Monitoring performance is key to understand if one does the forecasting well. Without monitoring and measurement there is no telling if an error occurs and if one should continue doing what they do.
5. Mastering the Risk	Following the measurement, mastering the risk of how and why the forecast could be wrong and what needs to be done is what this entails. A risk-management in its core.
6. Mastering the Process	A good process will have a good outcome. This mastering includes doing all the above to master the whole forecasting process and not forgetting its distinct place.

2.3 Methods of demand forecasting

Demand forecasting methods are critical tools for organizations to use in adequately estimating future demand for their products or services. Proper demand forecasting is key for a company's performance since it helps them to plan their production, inventory, and staffing needs accordingly. There are various methods for forecasting demand, each with its own set of advantages and disadvantages. The ap-

proach chosen will be determined by certain aspects such as the type of business, the product or service offered, and the availability of data. (Sanders 2015, chapter 4.) Businesses can enhance their accuracy in estimating future demand, reduce the risk of stock-outs or excess inventory, and ultimately maximize profitability by using the most practical forecasting strategy. According to Sanders (2015, 51), all forecasting methods can be categorized into two more exhaustive categories (FIGURE 1): judgmental forecasting methods (or qualitative, subjective) and statistical forecasting methods (or quantitative, objective).

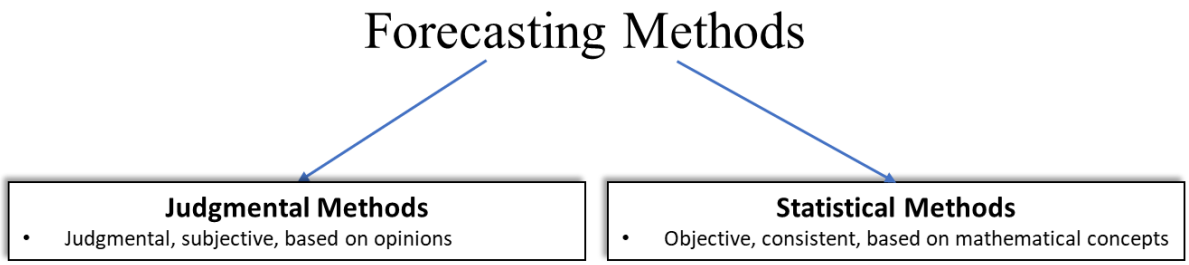

FIGURE 1. Categories of forecasting techniques (Adapted from Sanders 2015, 51)

Both methods have different practices, and each includes distinctive models in their arsenal. In essence, as described by Moon (2018, 103), both qualitative and quantitative methods are essential. Statistical tools can help one comprehend what happened in the past, and qualitative approaches can help forecast how the future will differ from the past. Furthermore, to further break down the statistical models into two categories, according to Moon (2018, 106), used in quantitative forecasting, the first one is its purpose of predicting and identifying the patterns that are related to time, and for that reason, time-series statistical techniques are used. The second category of patterns are the ones that are other than time, such as promotional activities, and these types of patterns are best identified and predicted with regression analysis, which can be utilized to see if these activities are influencing the demand.

As an almost perfect practice when forecasting, one should use both methods, and Sanders (2015, 55) argues that models of judgment and statistical forecasting are not mutually exclusive. One must not employ one at the expense of the other, and each method has pros and cons (APPENDIX 1). The main takeaway of qualitative forecasting and quantitative forecasting is that using qualitative approaches to enhance quantitative ones will typically improve forecasts (Moon 2018, 149).

2.3.1 Quantitative forecasting

As has been already referred to, quantitative or statistical forecasting is further broken down into two categories: the time-series methods and the casual or regression analysis methods. Time series approaches are based on the assumption that future sales will follow the pattern(s) of previous sales. In other words, time series approaches rely on identifying patterns (i.e., trend, seasonality, and/or cyclical) within the previous sales history of the goods or services being projected and assuming that those trends will continue. Some of the time series approaches are the Naïve model, Moving averaging, Exponential smoothing, Decomposition, and ARIMA model. In further detail, the naïve model simply replicates past sales to future sales, and it is the most essential time series approach. The moving averaging techniques are also known as smoothing models because they have the effect of "smoothing out" the volatility and dynamics of the market by utilizing mathematical equations and ruling out irrelevant periods. The most common time series approach is known as exponential smoothing. Their main idea is that the most recent sales volumes have a greater impact on the prediction and hence should be given more weight, for example, the sales in the past three or four months. Decomposition is a more complex time series approach. This technique is based on the notion that four fundamental aspects drive sales: trend, seasonality, cyclical influences, and random influences, and it employs a center moving average with equal weighting for all sales periods. ARIMA (Box-Jenkins) is the most advanced time series approach, combining critical aspects from both time series and regression models. In this case, autocorrelation coefficients identify the relationship between a variable at one time period and the same variable at another. Due to its complexity and higher-level of mathematics and statistics, it makes it difficult to understand, and thus, this model is less used. (Chase 2013, 84-85.)

Time series approaches have several characteristics that make them a good option for anticipating demand. These strategies are most effective for forecasting demand for a large number of products and products with a generally stable sales history. Furthermore, most time series approaches are straightforward to interpret and implement, and they may be quickly systematized with little data storage. Although time series approaches are often better suited for short-term forecasting, they remain a vital tool for businesses to predict future demand and make educated decisions. On the other hand, time series methods also present several fundamental limitations. Firstly, they require a significant amount of historical data, limiting their effectiveness in situations where limited data is available. Additionally, they may adjust slowly to changes in sales, and the process of determining the appropriate reasons can be

time-consuming and complex. Furthermore, time series methods tend to be less reliable when forecasting over more extended periods of time and may be particularly susceptible to large fluctuations in current data, leading to significant forecasting errors. (Chase 2013, 85-86.)

The primary premise of causal or regression techniques is that the future sales of a specific product are strongly correlated to shifts in relatable different variables. Changes in demand might be linked to pricing changes, advertising, sales promotions, and branding strategies. The nature of the variable must be defined to utilize the regression forecasting analysis further correctly. Some of the most widely implemented methods used are simple and multiple regression techniques. Simple regression is a technique that uses and relates only two variables to model a forecast by establishing a "casual" relationship, e.g., price change could drive demand. Demand is the dependent variable in this situation, whereas price is the independent variable. Moreover, in the multiple regression analysis techniques, more than two variables are put together to predict the demand for a product or service. It is worth mentioning that the relatable variables can be either external (cannot be controlled) or internal (can be controlled) to the organization. Causal models have been shown to yield more accurate short- to medium-term forecasts than time series methods alone and can present a chance for what-if analyses. However, there are significant drawbacks to using causal models. Firstly, their forecasting accuracy is relied heavily on a consistent and stable link between independent and dependent variables. Finally, accurate estimates of the independent variable are required for credible projections, and their production can be time-consuming and would need a firm understanding of statistics, making them less accessible to managers who lack solid analytical experiences. (Chase 2013, 86-87.)

2.3.2 Qualitative forecasting

Qualitative forecasting strategies develop and improve demand projections by relying on experienced people's judgment, knowledge, and intuition. The jury of executive opinion, the Delphi method, sales force composites, and market research are all strategies or models that are being used to gather expert opinions, and these are the primary approaches in judgmental methodology. To develop the demand projections, the evaluations rely on the expertise of persons who are familiar with a product line or a set of items, such as executives, salespeople, or marketing personnel. (Moon 2018, 139.)

Even though this thesis has namely referred to the most discussed and primary approaches to qualitative forecasting, it is needless to say that they must be described at an appropriate understanding

amount. The executive opinion is the first form of judgemental forecasting approach. This is a qualitative forecasting approach in which a group of managers, executives, or sales personnel convene and produce a prediction together. This strategy is not organized and relies on an unstructured group debate and opinion. This strategy is frequently used to forecast sales, market trends, strategic projections, and new product introductions. It may also be used to adjust current projections to account for one-time occurrences such as reduced expenditure during a recession or a particular promotional campaign. Advantages and disadvantages are common to the ones that come with any judgment, such as the latest insights are most likely to be on point because of the expertise in their own industry. However, biases, inconsistency, and the issue that comes with the rankings in a group are some of the disadvantages of that method (the most dominant role will most likely prevail). (Sanders 2015, 70-71.)

An extension to the aforementioned technique is the Delphi method that Mentzer et al. (2004, 154-155) described as the virtual jury of executive opinion, which includes taking opinions and inputs from several, if not many, executives in the field, either internal or external. Members to participate are selected and answer a question, which in this case is to lay out a forecast for a product or the whole industry. The answers are returned anonymously, and after the reviewed reply, the members will either re-evaluate their forecast or leave it as it was. This method reduces the issue that comes with the group work but is very time-consuming and thus expensive and targets the long-term forecast and not the operational ones. The third one that was mentioned is the sales force composite, which is closely related to market research. In this case, the company involves its sales (and even marketing) forces to provide the company with its sales forecast. The sales force composite forecasting technique has numerous advantages. It has the capacity to include the knowledge of those closest to the customer. Furthermore, this technique focuses forecasting accountability on individuals who have the power to directly alter product sales as well as the opportunity to suffer the consequences of their forecasting failures. (Moon 2018, 144-145.)

2.3.3 Combining methods

Apparently, to increase the accuracy and ensure the benefits of a forecast are collectively gained, a combination of methods and many various forecasting techniques and sources must be done. Tashman et al. (2016, 111) strongly argue that past research has shown that combining forecasts always gives greater accuracy. More sophisticated and simple combination methods can be applied to outperform a single forecasting method. Even Reeves, Ramaswamy, and O'Dea (2022) mention that according to

studies, an expert's sole judgment is frequently no better than a random guess; however, integrating many independent opinions, more likely accurate response and looking at aggregate forecasts can show the wisdom of the crowd. Even when forecasts differ, the collection of forecasts can indicate a shared set of essential variables or underlying trends (Reeves et al. 2022).

Recognizing that neither of these types of methodologies (quantitative or qualitative) is adequate for predicting excellence is a critical component of viewing forecasting as a management process. To be able to bring these two somewhat opposing forecast viewpoints together and support them further, a consensus process needs to be implemented that brings the relevant people together to reach a "consensus" forecast that everyone thinks is the best possible guess of future demand. These are of uttermost importance to achieve wholesome forecast excellence. (Moon 2018, 101.) Furthermore, Sanders (2015, 57) sets some criteria that must be met before the combination can be started. Different methods should be generated independently without inter-influencing each other, and they should be based on different information or sources. In addition, judgmental forecasts should be based on particular field experts and not be created by just anyone, which is called domain knowledge in forecasting language.

As to when and under which conditions combined forecasts are favored, Armstrong (2001) has noted that a combination of forecasts can be done if there is uncertainty as to which single method is suitable and most accurate. Moreover, he also mentions that one can combine forecasts from several methods when there is uncertainty in the forecasting situation itself, such as new product launches and long-term forecasting. Lastly, a combined forecast must be used to avoid huge errors such as bankruptcy in an organization.

2.4 Accuracy and benchmarking on demand forecasting

When someone is forecasting, they are predicting the future or at least trying to. One needs to consider that one of the forecasting concepts is that forecasts are rarely perfect and probably contemplate why someone should bother with projections in the first place. There are no means of anticipating or preparing for the future without a forecast. Even if a forecast is not flawless, it gives a general notion of what to expect. With that said, measuring forecasting accuracy and benchmarking is one of the processes of good forecasting. Demand forecasting accuracy refers to how closely the actual demand for a product matches the initial forecasted demand. With this definition, it is derived that without measur-

ing the actual benchmarking performance of a forecast, then the projection would be in vain. Measuring forecasting accuracy will give an idea of how things are going with the methods chosen. For example, since data are everchanging and, one must adapt to them, and so must the forecasts, which means that a method used once would not be favorable later. However, to see this through, one must measure the forecasting accuracy performance over time on a steady basis. (Sanders 2015, 32.)

Many variables can impact demand forecasting accuracy, including the quality and amount of historical data, the forecasting technique chosen, the accuracy of inputs, and the level of complexity in the forecasting model. Businesses may increase the accuracy of demand forecasting by combining forecasting approaches, collecting, and analyzing high-quality data, and regularly evaluating and refining their forecasting processes. Though these practices are well given, their complexity cannot be overruled, especially when numbers and judgement is involved. There are many different measures that this thesis will not get into, but all of them, according to Mentzer et al. (2004), fall into three categories: the actual measures, the measures relative to a perfect forecast, and the measures relative to an ideal forecasting technique. Furthermore, the most common accuracy measures include mean absolute deviation (MAD), mean absolute percentage error (MAPE), mean squared error (MSE), and mean fundamental percentage error (MFPE) (Mentzer et al. 2004).

2.5 Forecasting needs for each department

Some of the forecasting needs of each managerial function in the organization (sales, marketing, finance, sourcing, operations, logistics) are described in table 2. There are, however, some key terms in demand forecasting that each of these primary managerial functions utilizes differently, and these are the forecasting level, forecasting horizon, forecasting interval, and forecasting form. The forecasting level entails in how much detail a forecast is expressed in each function, and as a general rule, the more detailed it is, the less accurate it will be. The forecasting horizon's definition is how long the forecast is for (forecasted period), and it should not be shorter than a production lead-time and not longer than the capacity to be created. The forecasting interval describes the frequency of the forecast being updated; will it be weekly, monthly, quarterly, depending on the nature of the business. The forecasting form describes what types of measurement are being used when forecasting demand, and it can be in units (quantity) and/or in monetary value. (Moon 2018, 86-89.)

TABLE 2. Forecasting needs of different functions (Adapted from Moon 2018, 90)

	Marketing	**Sales**	**Finance**	**Sourcing**	**Logistics**	**Operations**
Needs	Marketing requires a prediction of predicted demand in order to successfully analyze promotional programs, new product releases, and other demand generation activities.	To obtain realistic sales quotas and effectively deploy sales resources to those regions and clients where they may be most employed, sales require a prediction of projected demand.	Finance requires a forecast in order to prepare for working capital requirements and to develop financial projections for both financial markets and government reporting.	Strategic: long-term contracts with suppliers of needed raw materials, components, or capital equipment providers. Tactical: control raw material and component part deliveries and stockpiles in the short term.	Strategic: long-term arrangements with transportation providers and storage assets. Tactical: address short-term transportation requirements as well as day-to-day distribution center operations.	Operations requires a forecast in order to arrange manufacturing runs as efficiently as possible and to prepare for expanded (or contracted) capacity in order to meet market demand.
Level	Brand or product level	Brand or product forecast by customer (even group of products)	SKU forecast	Product forecast for strategic and SKU for tactical	Product forecast for strategic	SKU forecast
Horizon	1-2 quarter	1 quarter -1 year	A month to a year	Leadtime to 2 years	Leadtime to 2 years	Leadtime to 2 yeatrs
Interval	Quarterly	Quarterly to annually	Monthly	Monthly	Monthly	Weekly to monthly
Form	Units that have been monetized	Units that have been monetized	Units	Units	Units	Units

2.6 Demand forecasting, demand planning, and the S&OP

Demand forecasting has already been defined as a company's best estimate of future demand based on a set of assumptions (Moon 2018, 83). The practice of taking action to prepare for the future is known as planning, and planning entails preparing resources in advance of a forecast and being ready for future events (Sanders 2015, 7). Planning can come in many forms, such as operational planning, financial planning, and demand planning, amongst others, and is a set of actions that comes after a forecast (FIGURE 2). In talks about operational planning, there is a business management process called sales and operations planning (or S&OP) that brings together managers, leaders, and executives to ensure that each business function (marketing, sales, finance, logistics) is aligned in balancing supply and demand. As a result, cross-functional teams are involved in developing precise predictions for sales. (Hart 2021.)

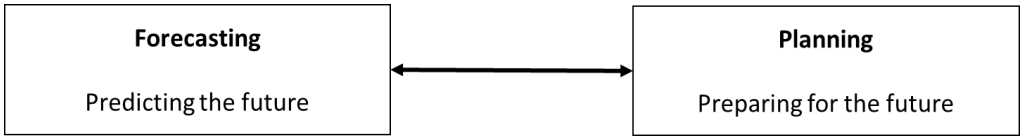

FIGURE 2. Forecasts drive plans (Adapted from Sanders 2015, 7)

To further understand what S&OP is and how it works, Mentzer et al. (2004) described it as a junction box (FIGURE 3) serving the demand side of an enterprise, which is marketing and sales on one side and on the other side serving the supply side which consists of manufacturing, sourcing, logistics, human resources, and finance. Through that junction box and as part of the S&OP process, information is flowing, preferably from both directions and not exclusively from one side.

FIGURE 3. The S&OP junction box (Adapted from Mentzer et al. 2004, 11)

The sales forecast arrow in figure 3, which is the expected demand of the future, similar to demand forecasting, comes from the demand side, and from the opposite comes the capacity plan from the supply side, which is a prediction for future supply capabilities based on a set of assumptions. This input is provided by the enterprise's supply side and documents both long-term and short-term supply capabilities. Out of the S&OP junction outputs, the operational plan back to supply, which can range from production schedules to long-term agreements with suppliers, and the demand plan back to demand function, which involves sales and marketing to come to an agreement about what should be sold and/or shift demand from one product to another as an example. (Mentzer et al. 2004, 11.) While the goal of S&OP is to establish a realistic demand plan that can be implemented, firms now see sales and operations planning as a tool to carry out a corporate strategy. An effective S&OP process strategically aligns the firm to execute tactically. However, most companies struggle to align and balance both supply and demand functions and often fall into the cost trap and focus on minimizing inventory and having a supply-driven culture. (Chase Jr. & Chase 2016, 35.) Ultimately, forecasts work as inserts to business plans. Also, a forecast, which is a guess about the future demand as well as what the supply capabilities could be, leads to plans and actions which by nature are conclusions as to what to do eventually. (Moon 2018, 200.)

2.7 The benefits of accurate demand forecasting in an organization

The benefits of demand forecasting have been consciously explained to some degree throughout this thesis already. Although one can never be clearer what forecasting, in general, brings as benefits, some people are still arguing about the value existence of even attempting to forecast the future. Moreover, they would probably be right given the fact that when we needed our forecasts to succeed and provide us with accurate predictions, they failed, for example, in the Great Recession or with the tremendous consequences of COVID-19 in terms of the economics and human consequences. (Petropoulos et al., 2022.)

Of course, these are one-side extremes that are referred to here, but nonetheless, in a business environment, there is no other way of implementing plans with informed decision-making. Sanders (2015, 5) points out that no business decision is being thought through without a forecast. When identifying customer trends, designing new products in anticipation of that trend, or even recognizing the opposition

emerging, a forecast would benefit in defining the business strategy. As a result, a forecast could provide a business with a competitive advantage. Another benefit that emerges is that it can increase the supply chain efficiency, meaning that when demand is forecasted to rise, the planned supply would be already on-point, resulting in better inventory management without overstocking. Moreover, forecasting can benefit the demands of labor or workforce that result from decreased or increased demand periods in sales so that one can avoid overstaffing or understaffing. (Sanders 2015, 6.)

All in all, the forecasting goals and objectives are to plan a more effective resource allocation in the business environment operationally and strategically, to have better production planning and improved inventory and waste management, to enhance customer satisfaction through timely and reliable delivery manner of orders, to identify trends and new sales opportunities and lastly enhance the collaboration between supplier and customer in the B2B context. However, these benefits cannot be realized just by forecasting but by forecasting accurately. Accurately forecasting will include, in the end, reduction of costs and increased profitability. Sanders (2015, 6) further argues that the quality of every business decision taken is dependent upon the quality and accuracy on the basis of the forecast taken. This means that if one is to make informed and intelligent business decisions, then the forecast for them needs to be identical in terms of the process (quality) and reliability (accuracy).

3 DEMAND FORECASTING PROCESS MANAGEMENT AND INTEGRATION

It has already been established in this thesis that whenever someone is trying to make a business decision; it is based on a forecast and, as a result, makes the forecast process in a business the most important function (Sanders 2015, 4). Although this function is vital, its integration can be rather complex. Communicating the demand forecast internally in an organization might not be enough in the business context because communication can be misinterpreted and unidirectional; that is, the information might be divulged with no feedback in return. Coordination is not substantial either since two or more functions might run at the expense of the other, which makes collaboration (the third integration notion) and working jointly toward mutual success the next step. (Moon 2018, 21-22.) However, Moon (2018, 22) further argues that the move to integration (the final notion), where multiple organizational entities behave as one to achieve broader organizational goals, is the final step for successful integration. Moreover, these different functions in an organization or an enterprise (FIGURE 4), such as finance, sales, marketing, supply chain, and leadership, can come together so that demand/supply integration can occur (Moon 2018, 23).

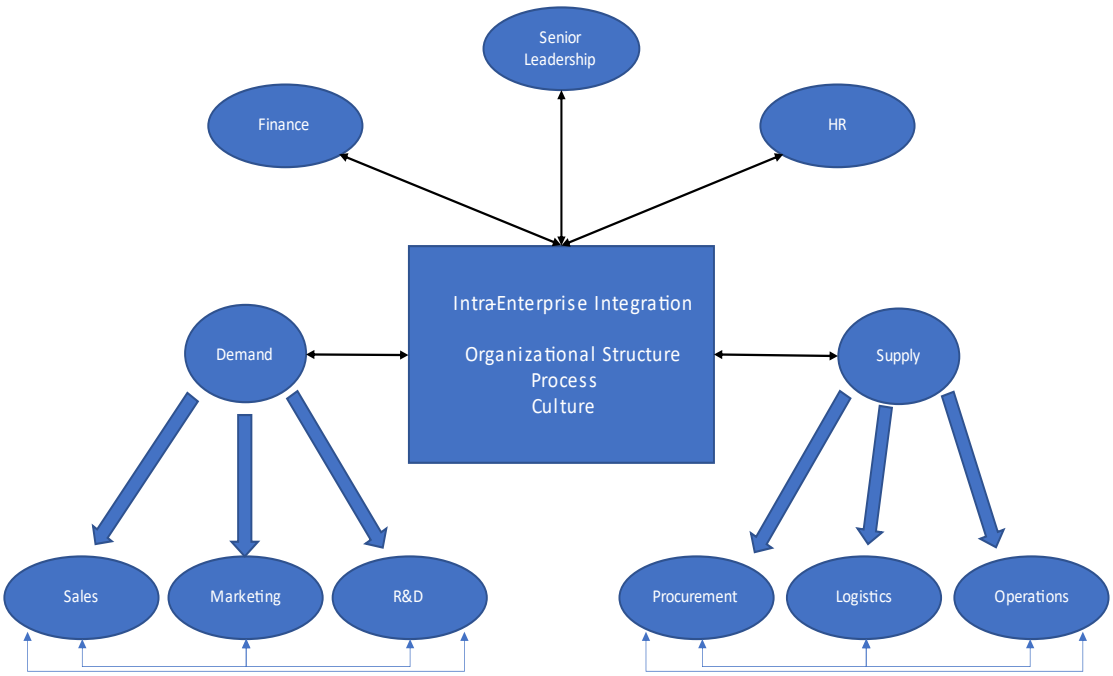

FIGURE 4. Intra-Enterprise Integration (Adapted from Moon 2018, 24)

As shown in figure 4, an enterprise is made up of demand functions, supply functions, and other supporting activities such as finance and human resources. Integration can and should take place between and within both of these functions. This idea is showcased in figure 4 by the multiple arrows, each of which offers a possibility for integration. The ability to supply products and/or services must be matched with the overall demand for goods and services. (Moon 2018, 25.)

3.1 The demand forecasting process

As with all other functions in a business, forecasting is a process with similarities to others but has unique goals and supports the rest of the functions in the best possible way. One of the keys to generating good forecasts is following a very well-grounded forecasting process. There are basic principles in forecasting that have been laying the ground for many years. To achieve good forecast outcomes, one must adhere to an established process that has been proven to be successful, and that process will make the basis of forecasting. (Sanders 2015, 17.)

3.1.1 Forecasting process principles

There are a couple of principles to have in mind before setting up the forecasting process. Forecasting involves uncertainty as there are many factors that cannot be predicted, either internal or external, so the principle here is to not aim for the perfect forecast but for the most accurate one. A good forecast with good accuracy and an average performance will prevent considerable errors in a business, leaving room for some minor errors to be made. As a second principle, one must consider that forecasts for a group of items are more accurate than for individual items. A group of items could be a product group, for example, so an unstableness in an item will not show such a significant impact on the whole group. It is vital in the sense that the expectations from the performance of a forecast should be somewhat different at a lower or a higher aggregation level, and when grouping items together, one can use forecasting strategies that fit and support an organization’s targeted goals. Some forecasting strategies are, for example, the top-down strategy that is looking at the whole industry and working down towards the demand that is projected for that organization and then even disaggregating or breaking down high estimates into smaller ones (extensive product portfolio into product groups). Additionally, the bottom-up approach is another one that aggregates individual items into product groups and works from there

to find the higher-level projected data for that company. As a third principle, short-term forecasts are likely more accurate than long-term ones. Updating the forecast regularly with fresh data will prevent significant errors in the short-term and will deblur the long-term. (Sanders 2015, 18-19.)

3.1.2 Forecasting process steps

Forecasts are created to aid with future planning. To do so, one must first determine which forecasts are genuinely required to lead the plan. There are six steps (FIGURE 5), according to Sanders (2015), to a successful and documented process. The first step when setting off the process is to identify what the actual issue is that one needs a forecast for and needs to consider, what question is set to be answered, the time period of the forecast, the frequency of collection of new data, and the decision of measurement units. The second step is to clean the data or have clean data essentially. The forecasting model and strategy will be as good as the data provided. The third step is identifying the data patterns by analyzing them and finding the ones that are there. The fourth step will be to select one or more forecasting models or methods that are appropriate, considering many variables such as cost-effectiveness, time horizon, and degree of accuracy, amongst others. The fifth step would be to create that forecast and interpret its values based on the data and model used. This is typically done through specialized software. Furthermore, finally, as with all functions' implementations, one has to monitor its performance, in that case, the forecast accuracy, which is a process that is everchanging because of the updated data and information available. (Sanders 2015, 20-25.)

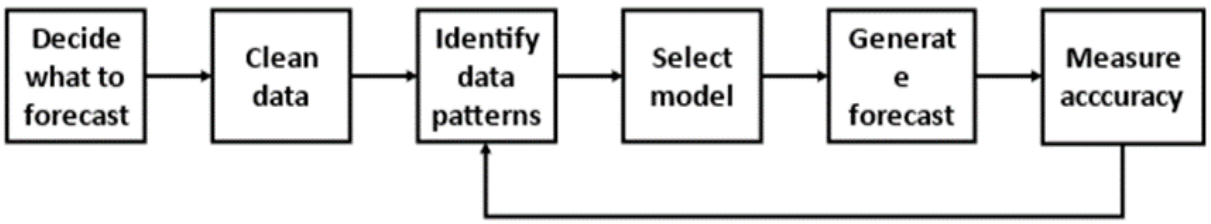

FIGURE 5. The forecasting process (Adapted from Sanders 2015, 20)

3.2 Integrating demand forecasting in an organization

There are different entities in an organization that comprise it and make the organization function as seamlessly as possible. Each of these entities will act in its own interest, such as sales will chase revenue targets, marketing will hunt for the highest market share, and the supply chain will continue to strive in inventory management and finance to run after profitability and marginal gains. All these entities need to come together for a successful integration of a function (e.g., demand forecasting) that interests the whole company. Moon (2018, 26) gives three mechanisms that could bring a successful outcome from integration, with the first two being the most unlikely ones: organizational structure, integrative processes, and organizational culture. Simply put, when it comes to demand forecasting in structuring, businesses will put the function of "demand planning" between the entities of sales and supply chain since it affects both directly. However, one must realize that both these entities have different ways of approaching and handling operations within, which will bring the forecaster into a conflict between two dissimilar ways of doing things. Rarely does an integration happen just because of restructuring in an organization alone, and it is even ineffective when it takes place alone. Moon (2018, 28) further argues that the formality of the processes that one company is implementing is not an optimal way to integrate because of the simple fact that they are time-consuming, costly to manage, and very complex with minimum wobble space. They most likely fail because the culture of integration is not in place; they are just a set of disciplined steps to follow.

As for the third mechanism, it is needless to say that from the two mentioned above, what is lacking to achieve integration successfully is culture. If the culture towards integration is there in processes and restructuring in an organization, then they would most likely have positive outcomes. Influencing organizational culture is unquestionably the most challenging and crucial strategy to achieve integration (Moon 2018, 29). One of the many definitions of culture, Merriam-Webster (nd) dictionary defines it as "the set of shared attitudes, values, goals, and practices that characterizes an institution or organization." The behavior and attitude norms that exist within a company have an impact on the culture of that organization. Some of the aspects that define an organizational culture are how people think, how they interact, what is important to them, what they wear, and what their work ethic is.

Transforming the cultural environment into an integration-friendly one is very difficult. It requires much effort from the management and the employees, from the highest to the lowest and vice versa. This means that enterprise executives must convey to all employees in an unambiguous and consistent manner that integration is a business necessity and that everyone must act accordingly from both sides.

Incentivizing and educating employees on the importance of forecasting and its integration into the business are maybe the two most efficient ways to drive cultural change from the bottom up. (Moon 2018, 29-32.)

3.3 Big data leverage

Technological advancements have had the most significant impact on forecasting. Now, these advancements include the availability of massive volumes of data (big data), analytical capability or analytics (using math and statistics to data), and advances in computing power (processing data enablement). In addition, these technological developments have only enabled to process big data faster and more accurately. However, with more data available comes more responsibility in keeping and processing them as updated as possible so that one can ensure the reliability of results. (Sanders 2015, 91-92.)

With companies getting these growing amounts of data at every stage and receiving information about their customers, suppliers, and day-to-day operations, big data is directly linked to forecasting since forecasting demands analyzing them. The merge of big data with analytical tools allows for turning that information into business intelligence. (Sanders 2015, 93-96.) Business intelligence is the procedural and highly technological system that collects, saves, and analyses data generated by a company's activities or operations. It then displays all that data in handy reports (graphical, and numerical) and performance measurements, amongst others, so that those responsible for making decisions will have more information at hand for better decision-making. (Frankenfield 2022.) With big data combined with analysis, which then turns into business intelligence, companies can start using predictive analytics. Predictive analytics analyzes current and past data to create predictions about the future using a number of approaches, such as statistics, modeling, and data mining. It has the ability to predict events ahead of time by detecting subtle changes throughout. (Sanders 2015, 97.)

3.4 Market intelligence in demand forecasting

Market intelligence or the information applied from either internal or external resources to demand forecasting will turn the process into an informed and framed guess. Market intelligence is a method of

obtaining, evaluating, and sharing information about the market environment in order to improve business decision-making (Moon 2018, 151). Ahmed (2023) also points out that market intelligence is important to stay updated when it comes to market trends and changes in an industry. Apart from the internal sources, which can be sales and marketing reports, the external sources can sometimes provide that third-eye look that would benefit the forecasting process. Some of the external sources could be academic research and governmental reports, but another more interesting source could be data given by a company's customers themselves, such as demand. There are two points of view or perspectives from which a forecast can be derived, and these are the bottom-up and the top-down approaches.

The sources can be categorized but in a much broader sense, market intelligence sources can be placed as micro- and macro-level. Micro-level sources could be handy for bottom-up forecasting, and they can be from the lower levels, such as the customer and/or product (SKU) based. Macro-level sources, often known as industry-based sources, are ones that might be beneficial for producing a top-down forecast. Micro-level sources will aggregate the insights received by the customers to generate a more concise forecast, and macro-level will examine the trends influencing the demand of the industry as a whole. Both top-down and bottom-up approaches provide valuable knowledge framing the assumptions that underlie the forecast and often work better if they are combined to create a final forecast. (Moon 2018, 151-153.)

3.4.1 Being part of the forecasting process

For market intelligence to be incorporated by demand forecasters into a demand forecasting process, there are some strategies to be adopted. First and foremost, as a starting point, one must identify the information that is needed from the sources and from whom to get it. Then, for both external and internal sources of information, the respective responsible persons usually provide these, and one must create a link and an incentive to collaborate with the demand forecasting process so that their interpretation can be achieved (qualitative forecasting). Thirdly, keeping in check the macro-level trends at a routine level will help with their documentation. And the contribution of the microlevel information as a part of the qualitative technique in the context of the demand forecasting process. Lastly, verifying the macrolevel data received is vital for their bias and accuracy since these two elements can largely affect the forecast. (Moon 2018, 154-155.)

Feigin (2011, 40-42) also supports the incorporation of outside forecasting sources into the process but advises that this input needs to be carefully observed. Customers may commence the forecast cooperation process by sharing their forecast with their suppliers in the hope that by offering a view of their expected demand, they will receive better or preferential service. Customers' forecasts should be regarded with caution. It is frequently overstated because they want providers to be prepared for the worst-case scenario rather than the most likely one. The first step in deciding if the internal prediction should be adjusted is to reconcile the customer forecast with the internally generated projection. If there is a large gap between the internal prediction and the customer forecast, a genuinely collaborative process will involve determining the fundamental reason for the disparity. If there is reason to assume that the customer prediction captures new information that is not included in the internal forecast at the end of this process, a modification to the forecast may be necessary. However, it is essential not to take customer allegations at face value. For example, a client may assert that demand will rise as a result of anticipated market share gains. Assuming this is accurate, it may not result in overall more robust demand for the company if this customer's competitors (from whose market share is allegedly being taken) are also clients of that company. (Feigin 2011, 40-42.)

3.4.2 A strategic bottom-up approach

A great source of information that can be extracted from an external source is the demand forecasts from the customers. Customer-generated demand forecasts can profit the organization in many ways, especially if that organization is a manufacturer that produces parts for its customers. There are different types of customers and different types of customer-generated forecasts. For an OEM customer, for example, that a manufacturing company supplies parts for, it is often expected that the OEM customer will provide a demand forecast and/or a production schedule of theirs to the manufacturing company. The reason for this has already been discussed in the previous chapters but shortly described is to maximize production efficiency and on-time delivery for the customer. Moreover, in many other cases, some general benefits that come with customer-generated forecasts are a closer collaboration that nurtures a relationship, relatively steady cash flow since delivering and invoicing with on-time shipments, and lastly, one gets some insights into the customer’s operations and long-term behavior. Nonetheless, there are some challenges to overcome, and those are (but are not limited to) if one should get these kinds of forecasts, with which customers to work, how that partnership will work, and how these forecasts can be included in a demand forecast process. (Moon 2018, 155-156.)

A customer-generated forecast incorporated into the supply chain of a company is a variable that makes it even more complex. That is the reason why these types of forecasts need to be integrated into the organization. More specifically, in figure 3 adapted from Mentzer et al. (2004) who discuss an intra-process, that is, the S&OP that tries to balance supply and demand across an organization's supply chain. Moon (2018), in his book, discusses a newly labeled process that is similar to the S&OP but differs in terms of time horizons, implementation responsibility, and, obviously, the name that Moon (2018) calls Demand/Supply Integration. From the name, only one can understand that balancing demand and supply is of uttermost importance, according to Moon (2018). When appropriately executed, DSI is a single process that engages all functions in establishing aligned, forward-looking plans and making decisions that optimize resources and achieve a balanced set of company goals (Moon 2018, 35).

In figure 6, one can understand the complexity and its risks when it comes to integrating customer-generated forecasts into an organization's supply chain. The arrows in figure 6 showcase where the integration could be done between a manufacturer and a customer in their respective DSI processes. The manufacturer's customer could share its demand plan significantly if other variables (such as promotional activities) could influence its demand planning so that the manufacturer can more accurately anticipate the increases (or decreases). That data from the customer could then be included in the demand forecast of the manufacturer. On the other hand, a manufacturer should share its operational plan (after a consensus planning) with the customer so that the customer can avoid shortages and production stops. Moreover, that shortage should be considered in the customer's capacity forecast of the finished product. The risks of taking in customer-generated forecasts are outlined in figure 6 in the form of questions. These questions need to be answered separately, but one must consider first if the benefits of this way of forecasting outweigh the costs. To answer the first question, one needs to measure the customer's forecast for accuracy and reliability. To answer the second question, it is a matter of translation of requirements from the end-consumer all the way to the manufacturer, so a decent DSI process must be in place. For the third question to be concluded, a simple discussion between the parties is needed so that the manufacturer can add the data into a forecast in terms of forecasting level. The fourth question might sound counter-intuitive as to why a customer should provide an inaccurate forecast. This could be done unintentionally or intentionally. The customer might forecast more deliberately so that they can be sure the manufacturer will deliver. If the actual demand is lower, the manufacturer will end up with overstock or, worse with obsolete stock. The fifth question is simply if an understanding between the parties of the benefits of providing a demand forecast, which this thesis has pointed out numerous times. The sixth and last risk question can be answered if only the manufacturer

has in place performance metrics to measure a forecast's performance, and if it does, is the customer willing to receive constructive feedback for it? In a stronger customer-supplier relationship, one can help the other to excel in providing high-quality forecasts. (Moon 2018, 156-159.)

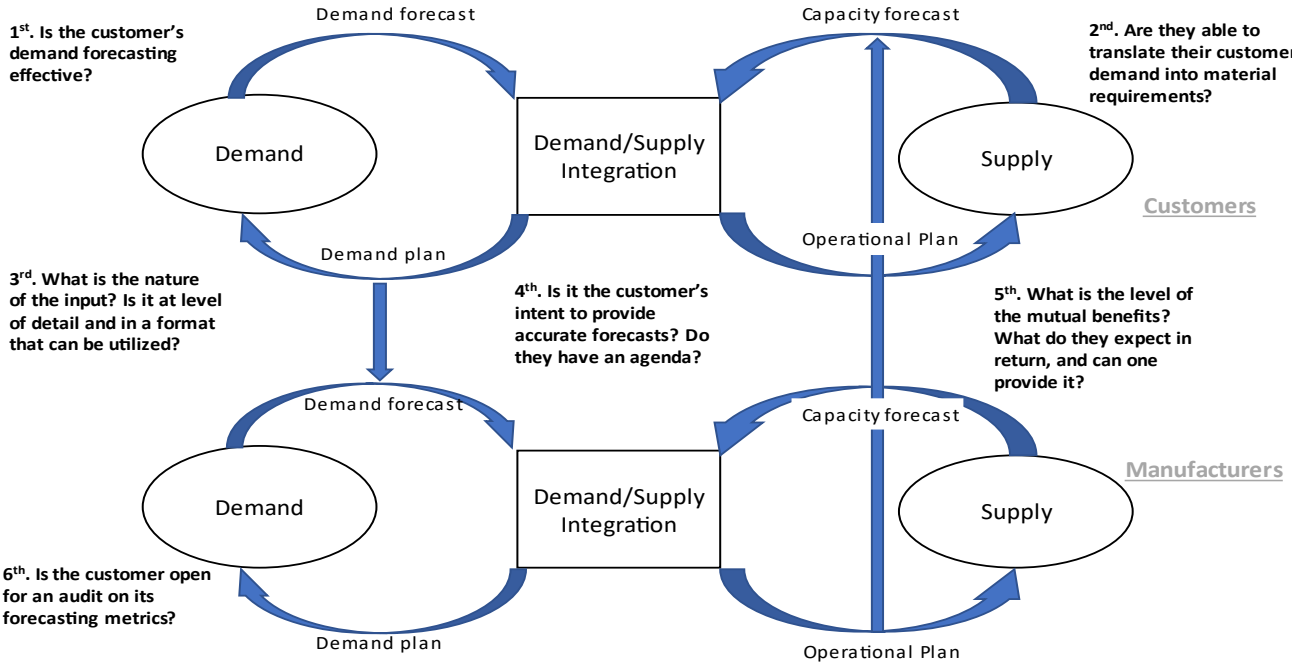

FIGURE 6. Risks with incorporating customer-generated forecasts into the demand/supply integration process (Adapted from Moon 2018, 157)

Typically, a manufacturer will choose its top five or ten customers revenue-wise to receive the forecasts from, but it can also choose to receive from one that is strategically important. Eventually, these customers who seek mutual benefit are the best ones to cooperate with. In addition, as to how these alliances can take place, it can range from informal practices (customer or manufacturer wants) to formal practices with agreements taking place that both parties need to sign and have an obligation to. Lastly, one must remember that the customer-generated forecast is not the end of the road but rather just an input to a consensus forecast that includes inputs from sales, market intelligence, statistical analysis, and product managers. (Moon 2018, 159-161.)

3.4.3 Independent, derived, and dependent demand and its risk

Moreover, there is an interesting concept that fits this bottom-up approach. In the context of demand forecasting and demand planning, some types of demand are slightly distinct and important to notice

and understand for even better accuracy and inventory management. These types are independent, derived, and dependent demand. The independent demand is the number of goods needed (by time and location) by the supply chain's end-user. Whether the end-use customer is a B2C type of business that sells to a consumer or a business purchasing products for consumption as part of its business operations (B2B), in both cases, they are determining the actual demand for the product or service flowing through the supply chain. Derived demand refers to the demand for raw resources or components required for the production of finished goods. This demand is derived from the final product demand. And thirdly, dependent demand pertains to the demand for components used to produce finished goods. This demand is determined by the production schedule and the finished product's BOM. For a manufacturing company, for example, that makes parts to fulfill its customers' BOMs and thus the finished product, it must consider that its dependent demand is derived from its customers' independent demand. Therefore, it makes the bottom-up approach and the customer-generated forecasts one very important asset in collaboration and smooth supply-chain flow. (Mentzer et al. 2004, 3-5.)

In the field of economics, the derived demand for a product is the demand that results from another related to that product. Moreover, in the context of the economics of the raw materials and parts, a shift in demand for the independent product does not necessarily mean that the dependent demand that is derived from that final product will decline if it can be used for other final products. However, the rule of thumb is that derived demand concepts work in both directions. When the demand for a product falls, so does the demand for the goods needed to make that product. (Barone 2023.)

This concept of independent to-dependent demand basically describes the two ends of a supply chain, from the manufacturer to the retailer. Mentzer et al. (2004, 5) point out that if the final demand of the end-consumer is one amount, then the retailer, to be on the safe side, will forecast slightly more to anticipate any errors (while accepting the risks). The same will continue across the supply chain, ending up with the starting point of the supply chain with an overstock and immense risks that have been amplified compared to the ending point. That concept has been identified as a bullwhip effect. In more accurate words, the bullwhip effect is dangerous because it magnifies inefficiencies in a supply chain as each step along the supply chain mispredicts demand. This might result in unnecessary inventory investment, lost income, deterioration in customer service, timetable delays, and even layoffs or, worse, bankruptcies. (Reiff 2023.)

4 HERRMANS BIKE COMPONENTS LTD – A DEMAND FORECASTING ENTHUSIAST

This thesis was commissioned by a well-known industry leader with a long history of product innovation, and a reputation for excellent quality which is called Herrmans Bike Components Ltd. Herrmans is a Finnish company that designs and manufactures bicycle grips, lights, chain guards, reflectors, and rim tapes. Many of their items are also used in the rehabilitative industry and industrial settings, which is a valuable contribution to other areas than their main one, which is bike parts. The company's competence gives it room to address client requests and inquiries for specific solutions and customized goods, which are highly valued by the end consumers, who are mostly bikers from across the globe. (Herrmans 2023a.)

Product quality is as important as the quality of the working environment for the company's employees since it provides growth opportunities through responsibility. Herrmans greatly values and respects the customer experience and satisfaction since most of its customers are other OEM brands that need their parts for their complete products. That is also why Herrmans is committed in staying current with the industry's trends and developments. Additionally, collaboration practices is in the company's roots because it is in their core that combining ideas from both parties (company and customer), is invaluable and its key to success. Ultimately, by balancing collaboration, it has enabled the company to continuously develop and even offer advantages over its competitors through great service and outstanding products. It is hardly unexpected, then, that they would commission a thesis to refine further their collaborative forecasting function and improve their offerings, as well as to ensure that they stay at the forefront of an ever-changing business while maintaining their dedication to quality and partnership culture.

4.1 Company history and future

At the beginning of Herrmans Bike Components Ltd.'s history, the company that this thesis is written for and about was built upon dreams and firm ambitions. From the company's inception in 1959 by Bernhard Herrmans in a small town on the west coast of Finland, with the company's first-ever product -the rim tape-the company's founder saw the potential for automation and took a leap to modernize its production early on. Since then, the company now designs and manufactures indispensable bicycle parts that conform to modern quality requirements and regulations. This pioneering mindset continues

to drive the company every day, in terms of commitment to excel within its environment of expertise. With every new product and every new idea, the company is motivated by a relentless pursuit of excellence and a desire to stay ahead of the curve. (Herrmans 2020a.)

Moreover, Herrmans Bike Components Ltd. is part of the Herrmans Group (PICTURE 1), which also includes another leading company that specializes in developing, producing, and selling lighting for heavy-duty vehicles. According to a December 2018 deal, a Finnish private equity firm, Sponsor Capital, became the new majority owner of Herrmans Group at the end of 2018. All former owners remained as significant shareholders. (Herrmans 2019.)

PICTURE 1. Herrmans Group Brands (Nordic Lights, 2018)

Herrmans Oy Ab's two independent enterprises, Nordic Lights and Herrmans Bike Components, split into separate companies at the beginning of 2020, giving them the opportunity to be more flexible in conducting business, to focus their expertise in their respective areas, and have the global market as their work-field. From that moment on, Herrmans Bike Components Ltd. has seen a restructuring of its organizational structure in order to meet the demands of the future. (Herrmans 2020b.) The goods that are manufactured are primarily sold to OEMs and the aftermarket in Europe, but also in the APAC area and the United States. In 2021, the turnover and staff counts were 31 million euros and 70, respectively (Sponsor Capital, nd).

It is worth mentioning that the future of Herrmans Bike Components Ltd. is shaped by the sustainability notion and mindset. That is, Herrmans Bike Components Ltd. is devoted to sustainability and the ethical use of resources and thus wants to be a trailblazer in the bike industry in terms of sustainability. They believe in the triple-bottom-line strategy of balancing social, environmental, and economic issues in all their activities. Being a pioneer in the bicycle industry, they are dedicated to establishing the bar

for sustainable business practices. They are committed to continuous development and incorporating sustainability into all parts of the operations, governed by appropriate international standards and best practices. This policy serves as the foundation for all organizational operations and decision-making processes. (Herrmans 2023b.)

4.2 Forecasting demand for Herrmans Bike Components Ltd

The so far materials presented in this thesis have pointed out that a manufacturer of dependent demand products (such as parts of a finalized-independent product) would be benefited from a close collaboration when it comes to forecasting demand for its products. Even more, this collaboration is not exclusive to the manufacturer but bears fruitful outcomes for the customer, too. For Herrmans (the thesis commissioner), as a manufacturer of bike components and with a customer base ranging from OEMs, wholesalers, and aftermarket distributors (Sponsor Capital, nd), it would make sense to utilize the bottom-up approach mentioned in the previous chapter by Moon (2018, 155-161). Implementing such collaboration and process would require the rigorous integration that was also discussed during the last chapter by Moon (2018, 26-32) through cultural alignment with the forecasting process and its importance.

Moreover, Moon (2018, 155) also refers to another type of customer, who are called project-based customers, who are basically customers who run projects with a specific timeline and demand. For a manufacturing company, it would be ideal to have a forecast of demand for any particular project. Such a project example is Herrmans' collaboration with another bike parts manufacturer that supplies specific-colored parts for their exceptional target group (Oortwijn, 2020). However, the challenges with the customer-generated forecasts that Herrmans must consider were mentioned in the previous chapter in the form of questions that must trouble the receiving end of the forecast and would require further input from the customer and not just sharing a bunch of numbers with no insights. Additionally, by going back to the bullwhip effect that has been described by Reiff (2023) as the magnified outcome on the starting point of the supply chain, one can understand the seriousness of getting the forecast collaboration right for the sake of sustainability and the reduction of stress of the supply chain throughout its complete range.

5 EMPIRICAL RESEARCH METHODOLOGY

As part of this thesis paper, to establish the hypothesis that demand forecasting can improve overall operational efficiency, optimize inventory management, and influence customer experience levels, making it one of the key functions at a manufacturing company in the B2B business, one must undergo a study to validate that statement. Initiating a research not only in the commissioned company but also in other similar ones with the directly involved persons that utilize forecasting is the go-to course of action to follow, not only to prove or challenge the thesis statement but also to make that study and statement valid and reliable.

It is consequential that if one needs to undertake research, then it must be defined and excluded from other meanings. According to Saunders, Lewis, and Thornhill (2016, 5), research is a methodical way that people or researchers seek out meanings, abstract and practical implications, and generally other ideas to increase further the capacity of one's knowledge in a particular area or thing. From that definition, one can pick out two things that stand out, and that is the methodical way and the quest to extend the capacity of one's knowledge. By the methodical way, it is meant that the research is a rigorous way that involves methods of data collection, contends that the results are meaningful, and reveals any constraints that are associated with it. Moreover, it is meant to establish logical relationships and forbids the variable of belief. And, with the extension of knowledge, it is to convey that there is at least one objective or purpose to achieve, which by itself falls inside a time constraint and cannot be indefinite. (Saunders et al. 2016, 5.)

After the formulation of the research topic, which is to explore the importance of demand forecasting in B2B and, more specifically, at a manufacturing company, the next step would be to present the literature that would back up the research and give grounds to the said topic itself and vice-versa (Saunders et al. 2016, 10). That said, the theoretical framework presented in chapters 2 and 3 is interconnected with the research project and the topic. Further on in this chapter, the process of the research will be laid out so that a research framework can be set which the project will work within. A greater emphasis will be placed on the ethics of conducting a research project that includes gathering information and subjective (but not limited to) opinions from other persons.

5.1 Research Design

In the context of research design, which is to formulate the process of how one will answer the research questions set initially through the predetermined approach to the theory development, one must understand that the approach taken will influence the design of the research (Saunders et al. 2016, 162). The case of this thesis, the research could take both an inductive and deductive approach to its theory development, which is to produce a theory through the empirical data gathered from the research (inductive) and to produce data from the theory gathered (deductive) (Saunders & Lewis 2018, 113). Moreover, it is vital for a research design that the research purposes and questions (APPENDIX 2) are clearly defined, which in this thesis paper have been abstractly mentioned throughout.

The first step of the actual research design is to select a methodological design to undertake the research. The most used designs are quantitative and qualitative, and sometimes, a mix of both is also utilized so that greater accuracy, validity, and reliability can be reached. Quantitative studies most often include gathering numerical data and analyzing them through the help of software to reach a conclusion and an argument. The qualitative study most often includes collecting non-numeric data such as words, texts, videos, and other similar materials. (Saunders et al. 2016, 165) In this research project, a qualitative study will be implemented since the research questions and objectives have explanatory and exploratory characteristics, which, according to Saunders and Lewis (2018, 115-118), seek to explore a topic so that more knowledge can be extracted and simultaneously research will seek an explanation as to why that is. These two study purposes are best approached through a subjective (qualitative) study.

5.2 Data collection

To initially collect the data for a research project, one must first select from the total population (in an organization, for example, which is also the sampling frame) a sample of people from which the data will be collected. In the research context, that is called sampling. (Saunders & Lewis 2018, 138.) In order for the research questions of this study to be answered, non-probability purposive sampling has been selected, in which samples are selected purposefully based on the researcher's judgment (Saunders & Lewis 2018, 145). For the most straightforward reason, the persons who own the knowledge needed are the only ones who can answer the questions with specific and accurate data necessary for the research. So, this research will seek the persons in manufacturing companies that do business

within the B2B environment and are involved in their respective companies with the demand forecasting function to gather valuable data for analysis. Consequently, this original research is based on first-party data or primary data collected by the researcher for the study. When materials are collected for a primary study, one is more likely to get the high-quality data that is needed. (ATLAS.ti 2023.)

All of the aforementioned terms and definitions justify the fact that semi-constructed interviews will be conducted with the participants selected. Semi-constructed interviews often engage the interviewer and interviewee in an open discussion in which some topics need to be covered that have already been set by the interviewer beforehand. Nonetheless, the interviewer may decide, during the interview, the sequence and relevance of the questions to the interviewee. (Saunders & Lewis 2018, 158-159.) Through the course of the interviews, notes will be collected for further analysis, and no recorder will be used to avoid any agenda-like approach to the data collection and compromise the credibility of the research. In addition, since the nature of the research is exploratory (and then explanatory), it was not deemed necessary that complete transcriptions of interviews are needed for analysis, and it is also the preference of the researcher not to keep records of audio ultimately.

5.3 Data analysis

Since qualitative data that come from interviews most often comprises of large amounts of unstructured texts, they are very difficult to analyze. In contrast to quantitative analysis, which has structured and straightforward ways of analyzing numerical data, a qualitative data analysis does not have any similarly developed and definite rules that one must follow. Because of these large amounts of data gathered, the analysis of them can be tricky in terms of the richness they provide, resulting in potential failure in giving a greater significance than is needed. (Bryman 2012, 565.) To even distinguish between quantitative and qualitative, since what is going to be extracted from interviews are words, one must understand that words could have multiple meanings or even have unclear ones. From that, it can be pinpointed that the quality of a qualitative study is dependent on the interaction between data collection and analysis and then further gives room for meanings to be explored and explained. (Saunders et al. 2016, 568.)

In order to aid the analysis of the data gathered, self-memos will be recorded to document any ideas that occur that are relevant to the research, and transcript summaries will be written after each interview. The summaries will compress key findings and will help with the identification of relationships

between variables and themes. Moreover, these summaries can include comments on the setting and anything that occurred that could have influenced the nature of the data collection. (Saunders et al. 2016, 576-577.)

Ultimately, the analysis of data will be done with the approach of thematic analysis, which, according to Bryman (2012, 578), is one of the most common activities that entails the search for themes that will help with clustering the data to answer the research questions further. A thematic analysis is optimal when exploring interpretations of a phenomenon, just like the importance of demand forecasting that this research is seeking out, and it can also be used to produce descriptive and explanatory statements. As this approach is more generic by nature, it can be flexible in the analytical phase since it is not binding or constricting in terms of its application in analysis. (Saunders et al. 2016, 579-587.)

5.4 Reliability, validity and ethics

Tackling the measurements of qualitative research is somewhat more complex than with quantitative research, whose ability to produce concrete, reliable, and valid results is unquestionably more straight-forward. Similar to the two forecasting methods mentioned in figure 1, a qualitative study focuses on the quality and subjective knowledge through experiences, and the quantitative focuses on objectivity and thus relies upon more firm grounds when producing its results. (Leung, 2015.) Bryman (2012, 389) suggests that one can transform the meaning of reliability and validity in qualitative research to those already perceived in quantitative research.

Concerning validity in the qualitative context, one can relate it to credibility and transferability too in terms of manifesting valid results through credible ways that are also transferable to other studies (Bryman 2012, 390). The study is credible because the results of the study will be further evaluated in terms of the limitations of the study to ensure validation. Moreover, the way that the research questions have been formulated, there is no other way to produce valid results than with a qualitative study and with interviews, to be more precise. Concerning credibility even further, the research findings from the interviews will be backed up through the extensive theory this thesis has written. Generalizability or transferability of the findings has been considered but is not one of the main variables that this study will consider, which, according to Saunders & Lewis (2018, 134), is acceptable. However, the research will strive to produce in its findings contributions for other practical and theoretical circumstances. It must be mentioned that the topic of the study (exploring the importance of demand forecasting) was

initially selected because of a personal interest and occupation. However, during the research, any biases will be eliminated, and objectivity to the respondents' interview transcriptions is of the uttermost importance and will not be tampered with.

Regarding reliability in this research, apart from involving the data collection method used, it also consists of the analysis procedure and whether these two variables produce consistent findings (Saunders & Lewis 2018, 135). One must understand, though, that what confines a qualitative study is the human factor. Conducting interviews is a human interaction that entails the subjective element that contradicts the objective repeatability of the findings. However, one can strive to achieve a high degree of reliability, especially in interviewing, by rationally interpreting the findings. (Brinkmann 2013, 143.) Which is what this research will attempt to do. Here, there is one factor that threatens the reliability, and that is the subject bias factor due to the fact that the commissioner of this thesis, which might be the company where the research will be conducted partly, has employment ties with the researcher. However, it has been set clear between the researcher and the company that the total anonymity of the respondents will be held, and the objectivity toward the conclusions will not be misrepresented. Moreover, and probably one of the most important parts of this research is the ethical (and legal) considerations when conducting interview sessions, which have been described already. And to take further action, a letter of consent has been sent to the participants with all the information and context of the interview sessions and the study itself, as well as the ethical considerations and the choice to withdraw at any point if one so wishes.

6 FINDINGS AND DISCUSSIONS

In this section of this thesis, the results and findings of the conducted study will be presented and reported as detailed as possible. The research was separated into two main themes that have been predetermined (deductive approach) in accordance with the research questions so that they can be answered. That said, theme one and one-point-two are related to the first research question, whilst the scope of theme two is to answer the second research question. A third minor theme emerged during the study's preparation phase since the researcher decided to take a step further and ask in the closing stages of the interviews two questions that were needed to conclude the session and achieve the completion of it. This last part or theme does not have a research question assigned but will be used as closing remarks and aspects to consider for the future. Also, the summarization of the main findings will be included to provide a wholesome picture of the study itself. It must be noted that the research questions worked as pillars of this study and steered the conversations in the interview sessions.

Moreover, the discussion part of the results will also be included in this section, where the researcher can take the stage and address if the objectives of the research (APPENDIX 2) have been realized and, most importantly, if the research questions (APPENDIX 2) now have a coherent and clear answer each. In addition, it will be the place to link the theory described in the previous chapters with the results of the study, as this was also one of the main intentions of this thesis. Lastly, the practical implications of this study will also be included to provide some applied knowledge of demand forecasting to what the researcher believes is the penultimate goal of forecasting.

6.1 Context of the interviews

To fully understand the study that took place, it is necessary to put the context of how the interviews were conducted, with which participants, the timeline, and anything else that is relevant to the primary data acquisition from the interviews. The number of interviews that concluded the data of this research was six. All six interviews were conducted with different participants from three different companies to gain different perspectives and ultimately make this research more valuable in terms of variation of the data. Furthermore, five out of six interviews were organized in person, whilst the sixth one was done virtually through the help of a virtual meeting tool. The time per interview was between 45 minutes and 1 hour and 30 minutes. Additionally, the interview guideline that was used (APPENDIX

2) was slightly modified to fit the conversation with each participant, but the eventual outcome was the same. The sequence of the interviews, as well as the timetable, is shown in table 3.

TABLE 3. Participant information

Interviewee	**Company**	**Role/Department**	**Interaction**	**Timeline**
Interviewee Alpha	Company X	Sales	In-person	July 2023
Interviewee Bravo	Company X	Demand/Supply Planner	In-person	July 2023
Interviewee Charlie	Company X	Supply Chain	In-person	August 2023
Interviewee Delta	Company X	Sales	In-person	August 2023
Interviewee Echo	Company Y	Demand/Supply Planner	In-person	August 2023
Interviewee Foxtrot	Company Z	Supply Chain	Virtually	October 2023

Although the empirical research took four months to complete due to the summer period (and thus more challenges to get hold of the needed persons), the study was completed successfully. It is worth mentioning that the participants were from different roles and departments in their respective companies (in total, three different ones), giving the study even more differentiation in viewpoints and strong validation features. Ultimately, the confidentiality of the companies and the participants must be kept since that is what has been established between the researcher and the participants through the letter of consent and, therefore, cannot be violated.

6.2 Thematic coding of the data and findings

The research mainly followed a deductive approach since the themes have been pre-determined in order to answer the research questions and then provide data to support the arguments of the theory. Further in this chapter, the results will be presented after the thematic analysis has been concluded with the help of categorizing the codes that emerged from the responses of the participants. The number of

codes that turned out from the research was 140 in total, all with their own description based on the responses. The researcher has consolidated these individual codes into 15 categories (based on the questions that were asked), of which 8 of them are meant for theme one, 5 of them for theme two, and 2 for theme three. The researcher does not exclude the possibility that some of these categories can fit into more than one theme. (TABLE 4.)

TABLE 4. Consolidated thematic codes

Theme one code categories	**Theme two code categories**	**Theme three code categories**
Impact of Demand Forecasting	Integration of Customer Forecasts	Forecasting Competitive Advantage
Information Utilization	Optimal Way of Integration	Demand Forecasting Development
Key Benefits	Direct Customer-Ex Affection	
Past Challenges	Ways of Mutual Success	
Overcoming Challenges	Customer/Supplier Intelligence	
Strategic Decision Example		
Accuracy Perception		
Expectation on Accuracy		

6.3 Establishing rapport with the interviewees

Each of the interview sessions started with a connection (warm-up) conversation to settle the background of the interviewee with as much detail as possible. Also, this rapport establishment functioned as a validation that the interviewees' opinions were backed up with experiences and knowledge of the topic of the interview. For that reason, it is of the utmost importance that the key results of this background check should be stated in this report.

All of the interviewees hold positions of influence in their respective companies (ranging from sales management to supply chain and demand/supply planning), some more than the others but equally when it comes to forecasting. Moreover, they have extensive knowledge of their current role and their surrounding departments since each interviewee has come from many different roles before acquiring

the current position. As a result, one can note the involvement of various departments within a company when it comes to forecasting. Additionally, when asked about their appeal to the industry they are working in, interviewees Alpha, Charlie, Delta, and Echo mentioned personal drivers that can be considered as their motivation in doing what they do at work. It can also be regarded as their drive for excellence.

In further detail of their background, adaptations in response to company growth demands were mentioned by both interviewees, Bravo and Echo. Echo's role is to assist the company's growth through demand/supply planning, and Bravo was chosen to build sales techniques to fulfil growth expectations. Another pattern that appears when asked more specifically about their experience with demand forecasting is the collaborative approach they have taken. Alpha and Bravo highlight the value of collaboration by emphasizing their roles as a vital link between sales and internal procedures. Also, Charlie is leading the creation of supplier collaborations and agreements in demand forecasting takes part in. Echo and Foxtrot conduct conversations either internally or externally to acquire insights, indicating a collaborative forecasting strategy. Interviewees emphasize the necessity of working together to achieve similar goals, whether with essential stakeholders, internal teams, or external partners. Therefore, the emphasis on their previous experiences with customer collaboration shows the forecasting's interactive character and its impact on customer relationships.

6.4 Theme one: exploring the demand forecasting function

Following up, after the rapport had been established and already having asked the background not only on the respondents' career in general but also with demand forecasting, it was easier to start the to-the-point conversation and start framing the first research question. Due to the fact that the study included persons from different departments, it resulted in different opinions and data, but that was what made the study more valuable. As a consequence, the researcher shares the data found from the participants per question asked in this particular theme.

So, since the previous question was about the former experience with forecasting, the researcher wanted to link that with the latest thoughts about it and break it down into detail. In theme one, the interviewees were asked first how demand forecasting impacts their operations or their daily work. The responses show that demand forecasting is more than just a tactical tool for short-term planning; it is

also a strategic asset that influences various aspects of operations, such as collaboration, resource allocation, risk mitigation, customer satisfaction, and long-term planning. In more detail, one of the most important distinction is that it impacts almost all of the respondents (except interviewee Delta) on a day-to-day basis. Some day-to-day influences are the creation of purchase proposals (Charlie), the prioritization of goods (Bravo), the ensuring of following the legal agreements (Alpha), the creation of a coherent file to be shared with the rest of the suppliers (Foxtrot) and the end-to-end supply chain process of translating that demand into supply (Echo). The difference with interviewee Delta was that it (the demand) influences them indirectly only, and some of the mentioned impacts were the long-term planning, the portfolio management, and being able to respond to the trend of the data graph proactively. Continuing on the indirect impacts, interviewees Alpha, Bravo, and Echo mentioned that the demand data has an interdepartmental impact on their company since it gives some directions on where to focus their resources. Finally, only Charlie said at this stage that the demand forecast could reduce the lead time required to source and/or produce the goods, and Alpha shortly hinted that it could be used as a risk mitigation tool if, for example, the demand is high in a specific product group and the supply cannot be met due to maintenance reasons, it can result in unsatisfied customers.

Further on, the researcher wanted to know how they utilize that information from the forecast in their or other departments to justify any activities. Interviewees Alpha, Bravo, Delta, and Foxtrot act similarly. They use it to inform on getting the capacity right compared to the demand if it is either people or machines that are needed to align other departments with the demand. Bravo said that it is used in combination with other tools to balance the budget of the company, which suggests demand forecasting is one of the key drivers in financial planning, as well. Somewhat the same occurred from Echo that the demand forecasting is used to monitor whether the forecast aligns with the company's overall plans, and if discrepancies arise, discussions with customers and internal stakeholders are initiated to understand the reasons behind the deviation. Additionally, Charlie utilizes that information with its department to inform their suppliers so that they can achieve just-in-time supply, and simultaneously, when it comes to new project initiation, they can use that demand as a tool for negotiation. These replies collectively illustrate the importance of demand forecasting in informing diverse actions within the relevant departments. It has an impact on interdepartmental communication, budgeting, resource allocation, supplier interactions, project launch, capacity planning, and strategic decision-making.

Moving on to the next question, the respondents were asked to list the key benefits of demand forecasting for a manufacturing company. First of all, it was surprisingly enjoyable to hear the respondents

listing three to four key benefits each. Because that meant they had seen more than one facet of demand forecasting. What has dominated the discussion in that stage is that, clearly, demand forecasting offers a foresight to what the future looks like data-wise in terms of demand, market trends, variations, and, if needed, adaptability to those. That is also known as business intelligence. Interviewees Alpha, Bravo, Charlie, and Echo had that feature on the top of their list with the key benefits, which is immensely encouraging and validating when it comes to justifying this whole study and its theoretical framework. Bravo stated, for example, that right where demand forecasting was needed the most to provide that overview, it was not available or utilized, and there was no way for them to avoid any unhappy situations such as overload: *If we had had it, we would have created a better overview and avoid unhappy situations"*. In talks of adaptability, agility, and the ability to respond to the changes, though, they were the second most listed features of demand forecasting. For Echo, Delta, and Charlie, it was the first to detail in the context of efficient production planning, data-driven future planning, and comprehensive planning, all of which demand forecasting has a support role, just as described in chapter 2 of this thesis. Charlie also mentioned the ability to plan financially with that tool since it provides a clearer picture of cash flow, enhancing financial stability and management.

The third dominant key benefit was the enhancement of the supplier and buyer relationship through the collaboration one goes through with the process of sharing demand. Alpha, Delta, and Foxtrot included that in their list, stating that it fosters the relationship and nurtures a good business transaction when it can also be utilized as a reason to meet. Something else that hovers on the same level of collaboration and can also be thought of as one-and-the-same is that demand forecasting smoothens the supply chain. Foxtrot described it as giving the supply chain firm reliability, whilst Bravo put it as timely availability of components, Charlie as a synchronized supply chain, and Delta as a support for the purchase formula optimization. Other traits of demand forecasting that were discussed were the aid it provides to investment and product range decisions, which ensures a streamlined and profitable product range. Moreover, an attribute that was mentioned only by Foxtrot and Bravo was that it contributes to the reduction of the lead time a product or group of products has, and this implies that by anticipating and communicating needs in advance, processes can be streamlined, leading to quicker delivery times. One can briefly conclude that demand forecasting brings to the table a range of benefits for a manufacturing company that the researcher believes should not be overlooked.

6.4.1 Theme one.2: Challenges

In order to not exclude the disadvantages of demand forecasting, the researcher included them in the study and, thus, in the interview sessions. While the direct question regarding the challenges that the participants have experienced with the demand forecasting process was only one, it was often seen and heard in the complete interview that the participants were always aware of its negative side. To get the whole picture of the importance of demand forecasting, one has to undergo a discussion as to how that process can harm a business. With the data from demand forecasting, where there are pros, there are also cons. A great example that is even confirmed by the theory in the previous chapters is that the first characteristic that threatens the data is biases and agendas. More specifically, all interviewees aside from Charlie made the valid points that since they are receiving forecasts from customers, and thus called demand, it is almost impossible to know what the agenda of the forecast is, and even to think that it has one then it could be marked as biased. Subjective treatment of forecasting is part of the wholesome equation, but there is a fine line between them discussed in the theoretical framework. To further point out the bias in forecasting, both Alpha and Echo mentioned that cross-departmental involvement is sometimes what brings biases to the data. There is a lack of completeness of data, which means that not every supposedly involved department had a say in it, either with numbers or subjective opinions.

This thesis has explained how robust and reliable a forecast is when both methods are involved. Delta, however, mentioned that if the forecasts from customers cannot adhere to a formal agreement, then there will always be uncertainty, and that highlights the delicate nature of demand forecasting. Two other separate challenges that were introduced to these interview sessions were the bullwhip effect and the risk of obsolete stock or inventory from Echo and Charlie, respectively. These are terms that the theoretical framework in chapter 3 has already put forward and are closely related. One of the bullwhip effect's outcomes is the overstock or obsolete inventory, which highlights the financial impact of poor forecasting practices due to (mainly) external factors (unstable circumstances). What was interesting, though, at this stage is that Foxtrot has not encountered any real challenges on the demand forecasting practices but only some inaccuracies in data due to programming failures that sometimes hinder the realization of the coherent forecasting file, which might give way to assume a blind spot in Foxtrot's response.

Furthermore, to continue to provide the first research question with some more context, the study moved on to find out how the participants had overcome these aforementioned challenges or if they

had not. Alpha and Bravo mentioned that some of the challenges have not been overcome, such as the time-consuming involvement of all the necessary departments and the lack of a monitoring system to follow up on the accuracy of the demand. Alpha optimistically pointed out though that with the identification of the problems, a solution can be found. Charlie provided a specific strategy to address the challenge of obsolete stock. The suggestion was to measure and analyze forecasts to identify reliable and unreliable forecasting sources. Additionally, an emphasis on the importance of collaboration, particularly with suppliers who may provide less accurate forecasts, was noted. Delta was focused on the way to hold each party accountable by signing forecasting agreements. This contractual approach helped mitigate uncertainties associated with non-binding forecasts. Echo suggested collecting information about the forecast from each involved party and confirming it and consequently completing the uncompleted data. According to the respondents, they are actively working to solve and alleviate the issues connected with demand forecasting. Their tactics include recognizing what does not work, assessing and potentially enhancing forecast systems, monitoring and analyzing forecasts, leveraging contractual agreements to ensure responsibility, and using strategies to collect and confirm accurate data. These initiatives demonstrate a dedication to ongoing development in demand forecasting processes and continuous exploration to make it worthwhile.

6.4.2 Theme one.2: Opportunities and accuracy

To understand and deepen the knowledge of the researcher (and the reader), the study turned to practical activities that emerged from having demand forecasting and can be thought of as opportunities and, why not, as competitive advantages, as well. Every interviewee had a somewhat different approach to the next opportunity question, which was what sort of strategic decision has been made with the help of demand forecasting. Bravo and Delta pointed out that demand forecasting supported their decisions to make informed investments. In this case, they opted not to invest in a new machine based on forecasting data, identifying a decrease in the expected use of that specific machine unit. This demonstrates how demand forecasting can have an immediate impact on capital investment decisions. Alpha simply demonstrated what has been said countless times in previous responses about resource allocation. An example (Alpha shared) was when they saw a ramp-up in the demand forecast in the manual labor section of the company, and they immediately were prepared to face and answer that demand by relocating the workforce from other departments on time, resulting in no delays for the customers: *"We knew what was going to happen and we reacted to it."* A similar example was shared by Charlie when they collaborated with a customer in Asia who shared the demand for some critical parts in good

time, and it aided in compensating for the transportation times from Europe to Asia. Charlie highlighted that they could not have anticipated the need without the help of demand forecasting, and this shows how it can directly enable a strategic decision regarding the timely supply in a critical and distant market. An opportunity for Echo was when it was time to acquire a big customer with lots of facilities to supply, making it highly complex. The access to the customer's demand forecasting information was practical while chasing that deal. This data influenced the judgments, planning, and adjustments required to acquire the customer and close the contract successfully. These examples illustrate how demand forecasting serves as a cornerstone for making strategic decisions in various contexts. The data extracted are clearly instrumental in shaping the strategic direction and success according to the respondents.

When it comes to discussing accuracy, though, that is when the respondents took a rather careful position or stance when answering. It turns out that the interviewees acknowledge the importance of accuracy in demand forecasting while also recognizing its inherent challenges and variability. The importance of forecasting derives from being a variable that is not 100% accurate, which this thesis also stated in theory, and the interviewees understand that. Alpha and Delta mentioned its controversial nature, while Bravo had seen issues from under-forecasting. Further, Charlie says that one must be realistic against it, possibly stating that one must consider setting meaningful targets, which is something Echo touched upon. Echo proposed that identifying goals that are important to the firm might help clarify what accuracy means in context, highlighting its subjective aspect. This suggests that accuracy targets should be in line with a company's strategic goals. Ultimately, when asked if a forecast can be accurate, it was evenly dependent on what each interviewee valued the most out of a forecast, but being mindful of it is what was underlined the most during the discussions. These perspectives emphasize the nuanced nature of demand forecasting accuracy and the necessity for personalized approaches.

6.5 Theme two: seeking mutual benefits

Similar to the theory in chapter 3, the empirical study aimed to answer the second research question and explore how demand forecasting supports both parties in whatever the aims might be (the aims and objectives to achieve have been examined according to the answers that are part of the first research question). A concept that was sought and described in chapter 3 was the incorporation of customer-generated forecasts within a company’s processes and decision-making. In this part of the interview, the researcher was focused on the specific subject of demand forecasting. It must be noted that this part

required the participants to have knowledge of the topic and some interaction with this type of incorporation process, which Foxtrot did not have substantially enough. However, questions about the benefits and outcomes that have been raised from this incorporation could be answered extensively.

6.5.1 Customer-generated forecast integration

To start the second part of the interview, the interviewer wanted to establish the fact that, indeed, the companies that the interviewees were representing were utilizing customer-generated forecasts, which Companies X and Y were in fact into this process. Nonetheless, in a follow-up question as to what they simply thought of their customers' forecasts being part of their forecasting processes, Alpha, Bravo, and Charlie described it as critical customer input. In more detail, Alpha implied that it matches their business model, Bravo emphasizes the effectiveness of this approach in understanding customer demand directly from the source as well, and Charlie suggests that customers have a significant role in shaping the company's strategies and strongly endorses it. However, Delta was reluctant to this external influence and advocated caution when relying solely on these types of forecasts. Delta recommended that it should be used in addition to other sources of demand data, proposing a cross-comparison and combination for a more comprehensive and accurate forecast. Echo also had the same view on this since they use customer-generated demand data besides other internal forecasting sources, such as historical figures.

To get a better understanding of what the respondents thought about this integration into their demand processes, they were asked further what they thought and felt about customer-generated data being part of their decision-making as a whole. The one main idea that came out from all the respondents, in summary, was that it is an excellent tool for informed decision-making. Charlie believed that without a demand forecast, a company is essentially blind: *"Without a forecast, you are blind, and if you have it, then your life becomes easier."* Nevertheless, closely monitoring that incoming demand from the customer, is equally vital so it can be answered through the right supply, which is what Echo described as well. Echo thought that since it provides valuable insights and a market view, it is acceptable to incorporate it. However, the importance of evaluating data quality, comprehending the assumptions underlying the forecasts, and recognizing the intrinsic value of information are all emphasized by Echo. Alpha and Bravo shared that bringing into a company customer-generated forecasts makes the entity more customer-centric since it similarly values the customers' data with the company's data when making a decision. However, Delta disagreed with this sole approach to decision-making, leaving the

situation insecure. Delta stood firm on the previous response that it must not be solely utilized and must be validated and compared with other external sources.

In between these past two interview questions, the participants were called to reply about how the company should integrate the customer-generated forecasts (optimal way) and what must be paid attention to. Alpha, Bravo, and Charlie underlined the need for analysis a lot. Alpha mentioned the importance of digitalized automation in the process, Bravo to disaggregate or aggregate the analysis depending on what is at stake, and Charlie to assign dedicated responsibility to a person or department to handle the forecasts that come in from the customers. Moreover, Charlie and Delta referred to that forecast as a long-term value planning tool across various aspects of the business. Delta made an excellent point about incorporating judgment to make sense of the data and enhance its relevance. Then, share the backed-up intelligence with the rest of the company inclusively. These findings provide helpful advice for improving the use of consumer projections to inform strategic decision-making.

6.5.2 Improving customer satisfaction and experience

Apart from seeing the benefits of demand forecasting from the perspective of the supplier, the interviewer wanted to explore what is in it for the buyer or customer when they engage in this type of collaboration and information sharing. Some of the benefits that were already mentioned are two-fold; for example, the supplier wins by knowing the demand of their customers in good time (demand forecast). With that information, they can implement all the necessary operations to maximize efficiency. The customer then will not experience any delays, enjoy reduced lead times, and avoid any overhead costs. Nonetheless, it was deemed necessary for the study to hear the participants' experience with improved customer experience due to demand forecasting.

The researcher asked a straightforward closed question with an obvious follow-up question as to why or how that is. The closed question was if they (the participants) thought that demand forecasting could help improve the customer experience and satisfaction. Unanimously, the interviewees were absolutely positive, with a distinct immediate reaction from Alpha, mentioning: *"100% it can"*. With the follow-up, how did they think it can help enhance it, the interviewees got the opportunity to express their previously positive answers. Starting with Alpha and Bravo, they both raised the importance of aligning supply with demand, which customers' demand contributes to. The customer hints at the demand and the supplier's capacity for a smoother transaction and delivery precision. As this is also a collaborative

process, it gives the customer (and the supplier) the opportunity and the forum to pass on any concerns or sudden changes, demonstrating a commitment to meeting customer needs efficiently and reliably. Also, Bravo and Foxtrot spoke briefly about the commitment to strengthened reliability in this close partnership and how this can influence customer satisfaction positively. Echo described that partnership as a value-driven approach that allows customers to feel valued and supported without being burdened by accountability while showing care and commitment to the customer's success. Delta, though, spoke about a benefit that is not directly beneficial to the customer but could be in the future, such as insight into product requirements. Seeing what the shifts or trends in product requirements are, manufacturers can leverage that to generate new businesses or even lose less that might be irrelevant. A separate distinction to Charlie's answer must be made as it was different from the rest of the responses to that question. Charlie broadened the perspective by noting that demand forecasting contributes not only to customer satisfaction but also to profitability and sustainable operations. It alleviates supply chain and people's stress, resulting in a more efficient operation in the long term. As a result of these responses, demand forecasting is clearly regarded as a strategic instrument for improving customer connections and promoting joint success.

6.6 Theme three: the future of demand forecasting

For the purpose of closing the interview session with each participant, the empirical study included a conclusion that was focused on the future of demand forecasting inside their respective companies and what practice is needed within forecasting to give someone a competitive advantage overall. This theme emerged in the preparation phase of this study to explore future developments and set a clear course for what is required to stay ahead of the curve.

On the first part of this theme, and the potential evolvement of demand forecasting within one's respective company, interviewees Bravo, Charlie, and Delta were of the same opinion to develop a monitoring procedure that pays attention to the variations and makes thoughtful interpretations of them. Moreover, Charlie's perspective was that demand forecasting would be involved in the long-term stock planning of the company, while Delta believed that it would be mainly a collaborative and business intelligence tool. Alpha saw it from another angle that matched Foxtrot's point of view. They emphasized greater customer participation in the future and saw it evolve with more forecasting collaborations. Alpha said: *"It disturbs me not to have one (demand forecast)."* Echo, on the other hand, underscored the potential for demand forecasting to allow the organization to plan for many situations and

their coexistence, weighing in the need to turn these scenarios into actionable targets that are in line with the company's objectives.

In the final part of this theme and interview session, Alpha and Echo stressed the importance of bringing all the involved departments into active participation and contribution to the process, highlighting the theory of successful forecasting process integration. Bravo and Foxtrot were of the opinion that a company must be more customer-centric and give back to the customer relevant information metrics regarding the performance of their demand and how well the supplier supplied effectively (providing factual information). Moreover, since this is a collaboration between two parties, the supplier would be waiting for the customer to provide a commented overview of their demand and how their planning looks henceforward. Delta's thoughts on this topic were somewhat collaborative but mostly internally within an organization. To bring demand forecasting into the fusion of a company's data as an added source was the needed action from Delta, where the inclusion of CRM and judgments are included in that pool of data. Lastly, one more time, Charlie's perspective on the question was noticeable compared to the other responses since the reply was a question: *"Why not forecast demand?"* clearly stating the necessity of doing so. Furthermore, Charlie considers using customer-generated forecasting to be a competitive advantage by itself. They see world-class forecasting as a method to outperform competitors, with demand forecasting positioned as a critical instrument for a company's operation.

6.7 Discussions of the research findings

Presenting and reporting the findings or results of a study that utilized semi-constructed interviews is not only about showcasing what the interviewed persons just said and viewed, coupled with the researcher's point of view. It is also a journey of seeking out new experiences and meanings on the subject the researcher has set off to find through conversations with its participants. (Brinkmann & Kvale 2015, 301.) Having that in mind throughout the process of interviewing and with the nature of the thesis being exploratory, the results of this study have provided a wholesome perspective rather than just data.

The research questions (or rather the research topics that troubled the author) were substantial and justified enough the approach to answer them. In addition, to disaggregate the research questions, the research objectives helped to narrow down what was required from the study and focus on specific areas of demand forecasting. These areas were the environment of B2B, how demand forecasting impacts,

challenges, eases and is perceived by the decision-making persons that utilize that function in their operations, and to find out the benefits of incorporating customer collaboration in the algorithm.

6.7.1 Summarization of the main findings

The results of the qualitative study indicate that, according to the interviewees, the demand forecasting function is a critical and multifaceted tool that has a significant impact on numerous parts of their operations and strategic decision-making. Moreover, demand forecasting plays a recognizable role in building customer relationships as it nurtures partnership-level interactions. It is also perceived as a synchronizer of the supply chain since it leads to the timely availability of components and reduces lead times. The study also demonstrates a correlation between data-driven insights that contribute to future planning while simultaneously allowing for judgmental data to make sense of them and presenting a comprehensive picture of the decision-making process. Nevertheless, for the study to be complete according to the research objectives, the challenges of forecasting were explored. The data suggests that there is an acknowledgment of the inherent difficulty in achieving high accuracy in demand forecasting. While total precision is desired, interviewees agree that it may not always be possible due to a variety of factors, such as the nature of products and the complexity of forecasting. Additionally, its integration into a company's processes and practices is perceived as challenging, and biases that emerge from that can be detrimental to the process. With that said, the accuracy of forecasting comes down to what each company defines as accurate, dependent on factors such as data granularity and the targets set by the organization. Ultimately, the replies reflect a favorable view of the demand forecasting function in manufacturing firms. It is seen as an invaluable tool that, when properly utilized, can lead to increased operational efficiency and strategic decision-making. While there are limitations, interviewees show pragmatic expertise in the intricacies involved in achieving high accuracy in demand forecasting.

As for the second research question and the assigned theme of mutual benefits through customer-generated forecasts, the responses collected from the interviews demonstrate the wide range of benefits it provides to suppliers as well as consumers. From the supplier standpoint, when receiving the forecast from the customers, companies stand to gain invaluable insights into demand trends, allowing them to better match their plans with those of their customers. Also, viewing customer-generated forecasts as a foundation for long-term planning, informed decision-making, and collaborative reliability, along with the addition of supplemental intelligence, improves their relevance and accuracy throughout. From the

customer's standpoint, their (most accurate) forecast contributes to delivery precision and supply-demand harmonization. It translates to asserting success for both while averting any inconveniences and uncomfortable replanning of production. For both parties, it enhances the interaction and understanding between the two when it comes to satisfaction and operational levels but gives more power to the customer as customer-generated forecast influences certain decisions within the suppliers' processes or strategies.

At a deeper level, demand forecasting advocates for collaboration that is rooted in value without overwhelming the customer, which results in establishing a foundation of trust and mutual benefit. Furthermore, beyond customer contentment, the analysis supports the theory that forecasting demand has a direct impact on profitability and sustainability by relieving operational stress and improving overall efficiency. Even so, the data from the study suggests that taking a hybrid approach to customer-generated forecasts by combining methods of forecasting, in-depth analyzing, and validating through external sources enhances its reliability and accuracy without compromising its integrity. The findings from the interviews present a nuanced and dynamic interplay between suppliers and customers, highlighted by the critical role demand forecasting plays in shaping a mutually beneficial and forward-thinking relationship. In addition to that, the findings of the last theme described the evolvement of the process to be more inclusive and approach it from an adaptable point of view with a solid incline to the intelligence it provides for an organization and support on the long-term planning and the pivotal elements that holds for the avoidance of unnecessary actions.

6.7.2 Interpretations of the results

The significance of the results may be evident to the researcher, but it is critical to spell out their significance for the reader, demonstrating exactly how they answer the research questions (McCombes 2023). In line with the hypothesis, which is also in the sub-title of this thesis, the results have provided valuable data to validate it at a satisfactory level. In regard to the first research question (APPENDIX 2), the results might suggest that demand forecasting is one of the top-tier tools a manufacturing company in the B2B business can utilize. However, based on the findings from the theory in this thesis, it is often perceived as either a supporting function that is good to have but is not on the priority list or is missed from the arsenal of tools of a company in that environment, or its foundational structure and meaning is misunderstood. The results from the respondents, though, show that in their respective companies, forecasting is used before planning, for example, which is the main misinterpretation of

forecasting. Given the fact that there is no perfect function or process without its disadvantages and challenges, which this study did not try to hide or misinterpret, demand forecasting can be a competitive advantage variable that is undoubtedly hard to implement. In addition to that, the author's personal interpretation of the results in theme one is that the study was a success and defined the same perspectives that went into the study beforehand (such as the theory) but also gave new thoughts and knowledge, specifically on the accuracy and the way demand forecasting navigates within different departments and manufacturing companies.

When it comes to the shorter but equally crucial second research question (APPENDIX), the results gave enough unanimous evidence and arguments that, indeed, customer experience, in combination with mutual success, is enhanced through demand forecasting collaboration. But that was one part of the aims of this research question, as the study sought to find out how the supplier is benefiting from that collaboration, too. There is a correlation between the first theme and the second theme in this research when it comes to that subject. Theme one provides, in theory, what are the benefits of demand forecasting for the supplier, and theme two deepens in the mutual manifestation of those benefits that were important for the thesis. Interestingly enough, there is a hesitance and a willingness to comprise within the decision-making the customer-generated demand, which both had very concrete arguments. This was also explored in theory (FIGURE 6) with the six questions to consider from Moon (2018) when adopting the bottom-up approach to demand forecasting, that is, from the source itself, the customer. One must avoid the naiveté that customers are fully committed to mutual growth and cooperation and do not have their own ambitions but must find the fine line and approach every relationship personalized.

One can also identify the relationship between the answers in connection with the participants' roles or departments. For instance, sales interviewees mention the importance of product range decisions, demand/supply planners discuss how essential it is for comprehensive planning, and supply chain describes the gravity it has for lead time reduction, all that with the help of demand forecasting and collaboration. On the contrary, there are also examples from the results that show how different departments or job descriptions align with each other. Demand/supply planners share common views with sales on how demand forecasting influences investment decisions and what the opportunities are, as well as sharing the same challenges with supply chain officials on need variations. What is more interesting in the interplay of perceptions and experiences is that interviewees from different companies have acknowledged and encountered similar practices and patterns in the forecasting function overall.

In context with the theory, the empirical part presented what was mainly discussed in the theoretical framework in a way that the data from the results supports and co-validates other authors' claims. The integration of demand forecasting into a company's processes was also a prominent pattern that was seen in the challenges and operational impacts of an organization. It is considered a challenge and also as a variable for bias, which is contradictory, but that is probable if no targets and definitions have been set in the integration process. More importantly, one unexpected perception that was indicated in the results was that demand forecasting could be a meaningful gateway to relieve the stress not only from the supply chain but, as a result of that, from the people working in it.

6.7.3 Implications and limitations of the research findings

Beyond the basic interpretation of results, research implications explain what the study's findings mean to researchers or to specific subgroups or populations. Even if the findings do not result in radical or disruptive changes to existing practices, they may have considerable implications for future research studies. (Alex 2023.) This research does not necessarily provide any new perspectives when it comes to the importance of demand forecasting, its performance, and its collaborative approach. The theory presented in this thesis formulated the research and the research questions, and in combination with the author's interest in the subject, the study was merely for exploration and explanation. Nevertheless, there are some notable implications to support the existing theory.

The study implies the critical importance of demand forecasting in streamlining production and inventory management processes, optimizing resource allocation and capacity, and, in some ways, it can be used as a risk mitigator. Excess inventory and stockouts can be reduced by using accurate forecasting methods, resulting in significant cost savings and improved financial importance. Moreover, the results implicitly suggest that demand forecasting is essential for the smoothness of the supply chain. It emphasizes the need for collaboration among suppliers, manufacturers, and distributors to ensure timely production and delivery, resulting in a more robust and agile supply chain throughout. The data contribute to a clearer understanding of accuracy in forecasting, and it is up to the definition of the respective company, meaning that depending on the granularity of the data and the targets or goals set, the accuracy will have different levels of achievement. As far as the mutually beneficial standpoint of this research is concerned, the empirical study builds on existing evidence that, apart from the direct gains, there are some indirect positive effects from the incorporation of customer-generated forecasts. These forecasts can be added to the data pool for business intelligence, which are tools to reveal insights for

making informed strategic decisions that affect both the short- and long-term planning of a company in B2B. Lastly, these practices indirectly affect the customer experience as it implies a customer-centric approach to decision-making.

In a surprising discussion towards the conclusion part of the interviews, the participants provided some very insightful examples of how they see demand forecasting evolve inside their particular companies and how it can be used to allow a competitive edge against other companies. It was surprising because the authors' intentions or thoughts were not how to surpass competition through demand forecasting. However, as it turned out from the responses, the forecasting process can positively impact a company's added value to the competitive strategy. Through engagement, extensive analysis, and collaboration, demand forecasting can keep customers closer to their partnered suppliers and make it more challenging to shift to another.

As the implications show the contribution of the study to the specific topic or field and to existing research, to recognize to the reader why it is meaningful, one must describe the limitations of this particular exploration. Although limitations address a study's possible flaws, they simultaneously enhance the study by exposing any issues that may have occurred before, during, or after the research that the reader ought to know before they reveal themselves. (McCombes 2023.) Several critical limitations of this study might be the limited population and time constraints since there were not enough resources or an extensive timeline that would have allowed for more input from other experts. In addition to that, the lack of secondary data to back up the empirical research is somewhat affecting the validity of the results and the generalization to some extent. Thirdly, as it has been reported before, the qualitative study produces results based on the subjectivity and experiences of the participants. That might relate to bias errors in the study even if the researcher reassures that it will be minimized. Another influence on bias error is external factors that took place during the study's timeline and were out of the researcher's control, such as pandemics and wars that might have meddled with the opinions of the participants, which is also known as time-sensitive limitation. Finally, since this study was note-recorded, there were not enough direct quotes from the interviewees to establish their explicit arguments. Acknowledging the aforementioned limitations without being exclusive to these, the researcher accepts responsibility and shows transparency to the study's challenges (Viera 2023).

7 CONCLUSION

In the introduction part of this thesis, there is a metaphor that started and ignited the idea of researching further the topic of the said thesis. To conclude this metaphor, after the theoretical framework and the empirical research that was conducted, one can further explain its context and meaning now. The metaphor characterized the umbrella as the action or plan that is taken to avoid the rain, hence getting wet, essentially preparing for the outcome that the forecast has given or insighted. However, there is a considerable risk that comes with this metaphor, and that is having to bear the umbrella for the rest of the journey or time period until you can get rid of it. That said, the umbrella also resembles the stock and the resources that were prepared to answer the demand that was forecasted. If it did not rain (meaning the demand was not what was expected), then one ends up holding the umbrella (meaning the stock and the resources) to no use, resulting in bearing the uncomfortable feeling of holding the umbrella (stock) throughout, until it can be dumped which would mean losing the initial value it had. Nonetheless, there are ways to clear off that risk during the journey, for example, by handing off the umbrella to someone else (selling off the stock and utilizing the resources somewhere else). Alternatively, if one is not far away from the initial investment decision, to back out immediately once, there is good weather along the way, presumably amending any decisions. Eventually, one can conclude that demand forecasting is as important as its monitoring, and it is defined by the steering principles of an organization. Demand forecasting does not produce much-added value by itself, it can be detrimental to a company, and it is subject to the bullwhip effect by making use of it mindlessly.

All these concepts were some of the drivers for the exploration of its importance. Some of the aims were to explore existing literature on forecasting's role in general, to identify challenges and opportunities, to explore its impact, and to discover the collaboration element it entails that may contribute to the customer's experience. Doing so in a way that produces data and facts from the theory and research and further raises awareness firstly for the commissioned company and contributes to the existing research on demand forecasting. Moreover, the last aim or objective of this thesis work was to give insights for further development within the context of sustainable development that demand forecasting can contribute to. Through semi-constructed interviews and their analysis thematically, the study explored and explained the importance, impact, and challenges of demand forecasting as well as the inclusion of cooperation between the supplier and buyer to enhance not only their collaboration but also the supply chain as a whole and thus, the complete experience. The method used was sufficient enough

to come to concrete conclusions and provide precious qualitative data. However, the lack of triangulation or at least a comparison with secondary data is what could make this study inadequate from that perspective, even though the study included different roles and companies in its sampling selection. This led to successfully answering the research questions with adequate opinions and arguments to support the thesis statement further.

By answering the research questions and using the data from this thesis, the author can give some brief practical advice for the commissioner to progress with its demand forecasting process further. It can be derived from this thesis that demand forecasting can be used as a strategic tool for informed decision-making, and it can strengthen the relationship between the customers and the commissioner. The theory and empirical research were focused on and targeted issues within the commmisioners' business model and concerns. The author believes that the commissioner can benefit from the outcomes of this thesis. Herrmans should focus more on the critical aspect of monitoring their demand, which comes from their customers. Applying the numbers and data from their demand has been seen as harmful without monitoring and close collaboration with them. Even better, a demand review session must be established once a month (or as required) to go through different changes and variations, which can then be informed to different departments. In these sessions, the demand reviewer should lead with comments and conclusions and engage in an open discussion with the immediate responsible. In addition, the commissioner should find out what the challenges with the demand forecasting process are and address them as efficiently as possible. If there are any obstacles, or any departments or persons that do not understand the objectives and collaborative essence that customer-generated forecasts have, then several educational sessions with real-life examples must be considered. With education in demand forecasting one must explore the need to do so internally but also extend the collaboration externally with the customers so both parties are aligned and have mutual understanding of that collaboration. Moreover, to strategically understand the market, the commissioner must deploy demand forecasting cooperations with customers in different regions. That way, one can have a more comprehensive view of the market's needs. In the end, demand must be answered with a suitable supply, so it should be integrated within that supply process and achieve all the mutual benefits that customer centricity offers. To be able to realize all that, an investment in an exclusive job position that handles demand/supply-related topics must be seriously considered to support the company's KPIs for growth.

Furthermore, in regard to the supplementary development of the demand forecasting process, the commissioner should research its contribution to minimizing waste, stress, and costs, which are the three

sustainable pillars that drive the company today. That could result in maximizing the company's performance and promote sustainable practices that conform with today's and future standards which could be used as one of the main competitive advantages of Herrmans in the future. Further research is also needed to establish if collaborative demand forecasting is aiding in customer acquisition and retention activities, which, in fact, plays an influential role or complicates the transactions.

In conclusion, this thesis adventure has given the researcher a profound understanding of demand forecasting both in theory and in practice. The synthesis of the theory studied, and the qualitative data findings have unveiled nuanced perceptions of the intricate dynamics of demand forecasting and, more specifically, in the context of customer-generated forecasts. Moreover, the results from the conversations with the interviewees highlight their broader applicability across diverse industries. This exploratory thesis lays the foundation for future research to build upon and offers a framework for customer-centric approaches and their integration into a company's strategic decision-making. Evidently, learning that demand forecasting paired with customer data insights can enhance the overall customer experience and operational efficiency at a manufacturing company.

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APPENDIX 1

Judgmental (qualitative) forecasting methods

Strengths	Weaknesses
• Responsive • Include “inside” information • Compensate for “one-time” or unusual events • Provide User with a sense of “ownership”	• Limited attention span • Short-term memory • Not recognize relationships • Biased (optimism, wishful thinking, political manipulation, lack of consistency)

Statistical (quantitative) forecasting methods

Strengths	Weaknesses
• Many variables and complex relationships • Objective • Consistent • Process large amounts of information	• Only as good as the data and model • Slow to react to change • Costly to model “soft” information • Requires technical understanding

Judgmental versus statistical forecasting methods (Adapted from Sanders, 2015)

Research Questions

How is the overall demand forecasting function or notion perceived by the decision-making persons in a manufacturing company?

AND

How is demand forecasting at a manufacturing company mutually beneficial for the customer and the company?

Research questions of the empirical study

Warming-up

1. Can you briefly introduce yourself and provide an overview of your role and responsibilities within the company?
2. How long have you been working in your current position?
3. What initially attracted you to this field or industry?
3. Can you share your experiences or background related to demand forecasting?

Theme one: General Knowledge and perception of Demand Forecasting

1. How does demand forecasting impact your (or your department's) operations?

2. How does your department currently use demand forecasting to inform its activities?
3. In your opinion, what are some of the key benefits of demand forecasting for a manufacturing company?

Theme one .2: Opportunities and Challenges

1. What challenges have you faced in the past when it comes to demand forecasting?
1. How have you overcome them?
2. Can you share an example of a time when demand forecasting helped you make a strategic decision?
3. What comes to mind when thinking about the accuracy of a demand forecast?
3a. Do you think one can be accurate or not?
3b. Why is that?

Theme two: Mutually beneficial

1. Does the company incorporate customer-generated forecasts into its demand forecasting processes?
1a. How are they doing that?
1b. How should the company incorporate customer-generated forecasts into its demand forecasting processes?
2. Do you think demand forecasting can help improve customer experience and satisfaction?
2. How do you think it can/cannot?
3. What do you think about the incorporation of customer-generated demand forecasting into the company's processes and decision-making?

Concluding-Theme three

1. How do you see demand forecasting evolving in the future inside the company?
1a. How do you think one can stay ahead of the curve with forecasting?

Interview questions were used as a guide through the semi-constructed interviews.

Research Objectives

- To review the existing literature on demand forecasting with an incline towards manufacturing and B2B
- To identify the challenges and opportunities of implementing demand forecasting in a manufacturing company
- To explore and determine the impact of demand forecasting on a manufacturing organization
- To explore and discover the relationship between demand forecasting and customer experience
- To raise awareness of the importance of demand forecasting and define it
- To provide insights for future development of the forecasting function towards its contribution to a company's sustainability goals.

Research objectives to be achieved through the thesis work.