

SUPPORTING SALES AND OPERATIONS PLANNING THROUGH FINANCE INVOLVEMENT

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Research objectives

The main objective of the research was to analyse how Finance can support sales and operations planning (S&OP). To support analysis of the main objective particular focus was placed on assessing how sales and operations planning can be coordinated, how financial forecasting can be integrated with S&OP and how performance measures can be utilized in S&OP.

Sources

Theoretic part of the thesis comprises wide array of journals, articles, books and research regarding S&OP, financial forecasting and performance measurement. On the other hand, empiric data was gathered through conducting interviews at five manufacturing companies.

Research method

The research was carried out as a descriptive and normative field study by interviewing ten (10) representatives from five (5) manufacturing companies. All interviews were recorded, transcribed and later validated with the interviewees. The research included analysing current practices and formulating improvement suggestions for each company by comparing the findings to theories. In addition, a comparative analysis of the identified practices was conducted.

Results

The research concluded that S&OP can be an effective way of coordinating functional planning activities and to support development of a common company-wide plan. It also concluded that Finance can support it by preparing financial forecasts in direct linkage to sales and operations plans as well as by establishing a S&OP scorecard and managing strategic measurement. Moreover, a comparative analysis of the companies resulted in a framework that can be used to assess Finance maturity in S&OP. In addition, each company were given suggestions to improve their current practices.

Key words

Sales and operations planning, S&OP, finance, accounting, financial planning, forecasting, performance measurement, scorecard, rolling forecasting

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1 INTRODUCTION

1.1 Overview of sales and operations planning

Sales and operations planning (S&OP) is one of the most talked about and appreciated process topics in business today (Sheldon, 2005). Although the process has existed for over 30 years (see Sheldon, 2006 for a history synopsis), it has recently faced resurgence due to e.g. increased customer demand for faster response to market shifts and for more made-to-order products and services (Muzumdar & Fontanella, 2006). Consequently, S&OP has been in the headlights of many books, journals and magazines during the last few years (see e.g. Bower 2006 & 2005; Dougherty & Christopher 2006; Dwyer 2000; Galluci, 2008; Grimson & Pyke 2007; Harwell 2006; Lapidé 2004, 2004-2005, 2005a, 2005b & 2007; Mentzer 2004; Olhager & Selldin 2007; Palmatier 2003; Proud 2007; Sheldon 2005 & 2006; Vollman et al. 2005; and Whisenant 2006).

Traditionally many organisations have operated under central control, through functional departments (Kaplan & Norton, 2001). As a reflection, planning of sales, production, distribution and procurement are often made within each of the functional departments and independently of each other (Feng et al., 2008). This easily leads to sub-optimisation and neglecting strategic plans. The purpose of S&OP is to monthly tackle these issues through coordinating individual planning efforts in a business while also linking strategic goals to production (Vollman et al., 2005). It has been described as a set of companywide planning and decision-making processes designed to balance the supply of products or services with the demand for them and to link day-to-day operations with business goals, operational planning, and financial planning (Smith, 2008). Moreover, according to Bower (2005) using S&OP to provide visibility and monitor corporate strategy can enable enterprise-wide alignment and execution of an overall corporate strategy while on the other hand companies without S&OP have been argued to have a disconnection between the strategic and business (financial) plans and the detailed plans and schedules (Wallace, 2004).

An efficient S&OP process is supposed to result in optimised inventory levels and increased customer service levels caused by higher product visibility (Mark, 2004). This is one of the reasons why the end phase of the process, often referred to as executive S&OP review, has been regarded

as one of the most powerful and influential meetings a company can hold (Sheldon, 2006). Based on the literature hype which has been partly illustrated here, it should be clear that a major practical interest in S&OP exists. On contrary, based on the discussions I have had with several management consultants, vast amount of companies still struggle even with the basics of sales and operations planning. This might come as a shock as balancing supply and demand should be just common sense to every business.

Regardless of the vast amount of S&OP publications, there is a great lack of purely academic research (Grimson & Pyke, 2007). In fact, researches by Feng et al. (2008) and Grimson & Pyke (2007) are one of the rare concentrating purely on sales and operations planning. Also a few recent Finnish Master's thesis discusses the topic from implementation and process point of views (see Ravi, 2007; Saarinen, 2008). In addition to these academic researches, there are several studies conducted by organisations such as Aberdeen Group, AMR Research, Gartner, and Ventana Research. Due to the reliability issues with these commercial studies and lack of purely academic research there inevitably is great need for further academic research.

Being Management Accountant, I will tackle S&OP through focusing on how Finance should support the process. In overall, literature implies two tasks that have generally been regarded as Finance's cup of tea. First, it has been argued that sales and operations plans should be converted into financial terms in order to make the plans understandable and to enable comparing them with business plan (Proud, 2007). Due to this aspect, S&OP has a strong connection to rolling forecasting which has had reasonable interest during the 21st century by both practioners and academics (e.g. Hope & Fraser 1999, 2003; Hansen Van der Stede, 2004). Second, it has been argued that the value of the sales and operations planning functions is questionable if there's no monitoring of performance (Vollman et al., 2005) and that a well-balanced scorecard is an integral part of good S&OP process (Gartner, 2008).

1.2 Research objectives

The main aim of the Master's thesis is to analyse how Finance function can support sales and operations planning. Viewpoint is on the input and output that finance should produce to improve S&OP and thus to better integrate marketing, operations and financial plans with strategic plans.

Existing academic research regarding these issues are limited. Although research on annual budgeting and rolling budgeting exist, they tend to focus on describing which practices companies are using rather than reasoning how they are using them.

While discussing how Finance can support S&OP, issues relating to the integration of operational planning and financial forecasting and utilising performance measures in operational planning will be addressed both from theoretic and empiric point of view. To summarise, several interesting research questions are studied in order to support examination of the main research problem:

1. How can sales and operations planning be coordinated?
2. How can financial planning be integrated with S&OP?
3. How can performance measures be utilised in S&OP?

The thesis has both descriptive and normative features. As descriptive case studies describe accounting systems, techniques and procedures currently used in practice (Scapens, 1990), the objective is to describe how companies included in the thesis currently operate S&OP and how do their Finance functions support it. On the other hand, the thesis is normative as it intends to define how each of these companies can improve their way of operating by comparing their practices to theories. Moreover, a comparative analysis of the current practices will be conducted through development of a maturity model regarding Finance support in S&OP.

1.3 Structure of the thesis

The thesis starts with a literature review of sales and operations planning. For accountants this chapter aims at creating a more holistic understanding of distinct planning activities in a company. This is extremely important due to the fact that literature suggests that Finance should have a significant role in taking part and facilitating monthly company-wide planning activities rather than working within their own silos and maybe creating financial forecasting without any linkage to the plans that operations are developing. In general, describing the process consolidates many

sources of S&OP literature thus offering an overall picture and understanding. Finance related aspects of S&OP will be presented in the Chapter 3 which ends the theoretic part of the thesis.

The research method will be presented in Chapter 4 which is followed by analysis of five manufacturing. The thesis ends with conclusions presented in Chapter 5.

1.4 Definitions

Finance

Finance is used as a synonym to finance and accounting function in general, thus including business controlling activities.

Financial forecasting

Financial forecasting is a process of estimating the expected financial results of the future.

Financial reconciliation

Financial reconciliation means the conversion of operational plans into financial terms.

Sales and operations planning (S&OP)

Sales and operations planning is a procedure that aims at keeping demand and supply in balance. It is a monthly or quarterly cross-functional procedure including planning over a horizon of approximately 18 months. (Adapted from Wallace, 2004)

2 INSIGHT TO SALES AND OPERATIONS PLANNING

This chapter focuses on theories regarding sales and operations planning process in order to assure that an adequate understanding of the theme is perceived before going into discussing Finance's role in the process. The chapter starts by taking a look at a wide array of S&OP definitions and objectives, then moving into discussing the fundamentals of S&OP and its connection to strategic and detailed planning. Moreover, typical process phases of S&OP will be presented before discussing expected benefits of the process both from literature and research viewpoints at the end of the chapter.

2.1 Definition and objectives of S&OP

As was presented already in the Introduction, S&OP has been described as a set of companywide planning and decision-making processes designed to balance the supply of products or services with the demand for them and to link day-to-day operations with business goals, operational planning, and financial planning (Smith, 2008). Although there is no single official definition of S&OP, the previous by Smith incorporates four important aspects of the process. First, the process goes beyond functional units. Second, in addition to planning it is a decision-making process as it may include deciding on discontinuing facilities or acquiring new ones. Third, it aims to balance demand and supply sides of the business by discussing e.g. sales and production plans collaboratively. Fourth, it is to implement the company strategy by placing a link between strategic planning and operations.

Although Smith's definition incorporates important aspects of S&OP, it is it at the same time also very broad. Moreover, most pieces of S&OP literature are not able to give an unambiguous and detailed definition of the concept. According to Dougherty & Gray (2006) people may even use the term to mean many different things as some see it as a medium to long-term planning process while others might include also weekly planning into the picture. According to Grimson & Pyke (2007) planning horizons typically range from 6 months to over 3 years, but the most common horizon seems to be 6-18 months. However, they imply that the horizon varies by industry, by product seasonality, and by the time of year that S&OP planning occurs. Moreover, industries

that have long production lead times or high seasonality (apparel, pharmaceuticals, automotive products) will tend towards longer horizons, whereas short horizons will be more common in those with short lead times and low seasonality (commodity items) (Grimson & Pyke, 2007).

Furthermore, some organisations, such as Gartner and AMR Group (2006), have added their own flavour to the definition game by beginning to talk about integrated business planning (IBP) as an extension to sales and operations planning (see e.g. Gartner, 2008; Aberdeen Group, 2006). In their opinion S&OP has not been able to do nothing but to balance supply and demand while failing in recognising strategy. Moreover, the value of using the term IBP can be questioned since for instance Grimson & Pyke (2007) support the strategic linkage of S&OP by saying:

“S&OP is a business process that links the corporate strategic plan to daily operations plans and enables companies to balance demand and supply for their products.” (Grimson & Pyke, 2007)

In addition, balancing demand and supply can also be executed in varying forms. Feng et al. (2008) acknowledge three different kinds of S&OP approaches which differ on the level and structure which planning is done. The most advanced S&OP is supply-chain based S&OP (SC-S&OP) that integrates sales, production, distribution and procurement. On the other hand, sales-production planning-based S&OP (SP-S&OP) integrates sales and production planning while distribution and procurement planning is separated. The most unsophisticated structure is decoupled planning (DP) in which sales, production, distribution and procurement planning are all separated.

In order to showcase more holistically how S&OP is discussed in literature, key elements of sales and operations planning from several selected sources have been summarized into a table presented in *Appendix 1*. The table presents how several articles, research and books have defined S&OP, what are its goals and project phases et cetera. As can be noticed from the summary table, the definitions are quite similar to each other whereas differences exist in the details such as the time horizon and functional scope as has been discussed above.

This thesis sees sales and operations planning as a formalised monthly or quarterly process which integrates functional views of an organisation into a single and shared plan that ultimately should

drive strategy implementation. The key point here is that it incorporates several if not all functions of the company (marketing, sales, production, procurement, human resources, finance etc.) and aims at creating a common plan that everybody understands and agrees with. As Dougherty and Gray (2006) put it, S&OP integrates, synchronises and directs all of the detailed and functional planning efforts in a company, to ensure that they do not cause sub-optimisation or interference and that they are reconciled and mutually support overall company goals, especially strategic and financial plans. In contrast, if functions would develop their plans in silos, without cross-functional interaction, production would not e.g. be able to prepare for upcoming marketing campaigns that marketing function might be planning. It is clear that planning in silos could therefore lead to lethal actions for the company. Moreover, balancing supply and demand is not easy although it should be self-evident.

2.2 Fundamentals of S&OP

Obtaining a better understanding of sales and operations planning requires looking at four fundamental factors that are often presented in literature when trying to scope and introduce the S&OP concept. These four fundamentals; demand and supply, volume and mix; will be presented below (see e.g. Dougherty & Gray, 2006; Vollman, 2005; Wallace, 2004).

2.2.1 Demand and supply

As already mentioned, one objective of S&OP is to balance demand and supply sides of the business (see e.g. Bower, 2005; Dwyer, 2000; Grimson & Pyke, 2007; Smith, 2008; Whisenant, 2006). If demand greatly exceeds supply, adverse effects might appear as customer service might suffer, sometimes leading to lost business; costs might increase with overtime and premium freight; and quality might sometimes decline as the company strives mightily to get products shipped. On the other hand, over supply might lead to cash flow issues and underutilisation of resources due to increased inventories as well as to squeezed margins due to attempts to increase sales by cutting prices. (Dougherty & Gray, 2006)

It should be acknowledged that the optimal balance between the two variables is depended especially on the strategy of the company and the service levels it wants to offer. Moreover, excellent

service levels often requires not using assets to their fullest potential while it would probably negatively affect on service levels as there would be only little idle time to react to changes e.g. in customer behaviour. On the other hand, as Wallace (2004) points out future imbalance between supply and demand may be due to growing business and might be reflected in capacity addition discussions during S&OP.

2.2.2 Volume and mix

The other two fundamentals of S&OP are volume and mix. Both Dougherty & Gray (2006) and Wallace (2004) argue that S&OP should concentrate on volume rather than mix since volume is the big picture and mix is the details. They present that volume deals with product families whereas mix with individual products. Moreover, it might be more rational to first assess e.g. if you even have the capacity to produce the planned volume before going in to the mix issues.

In addition, Dougherty and Gray argue that many companies focus too much on the mix which in their opinion means overworking the details and not fully understanding the big picture. On the other hand, companies have found that when they do a good job of planning and re-planning volume (rates and levels) as they go through the year, their problems with mix become less difficult to deal with (Wallace, 2004).

2.3 Alignment between strategic and detailed planning

According to Wallace (2004) companies without S&OP frequently have a disconnection between the strategic and business (financial) plans and the detailed plans and schedules that are used to run daily operations. In other words, he thinks that the plans developed and authorised by top management are not connected to the plans and schedules that drive day-to-day activities on the plant floor, the receiving dock, and the shipping dock. Furthermore, he agrees that S&OP would link the top-level strategic and financial plans of the business to the week-to-week, day-to-day, or shift-to-shift activities of receiving and promising customer orders, acquiring material, converting it into finished product, and shipping it to customers. This linkage is presented in *Figure 1*.

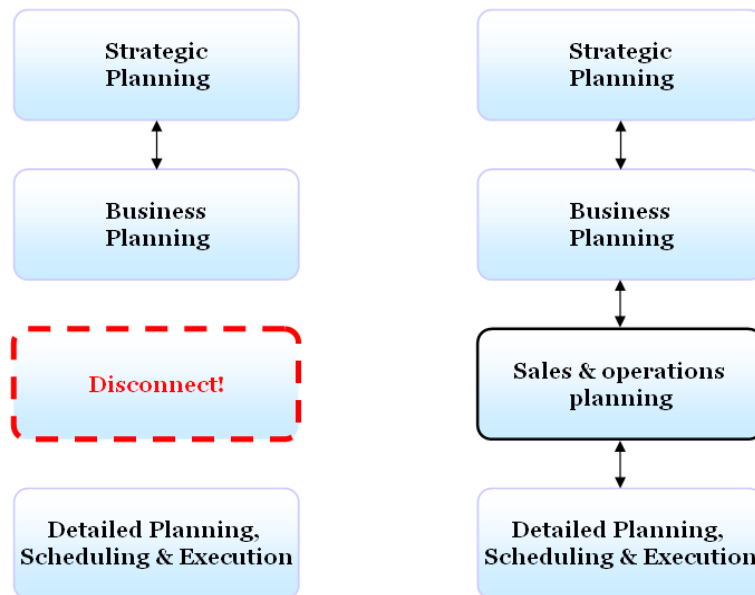


Figure 1: Sales and operations planning connects detailed planning to business and strategic planning (adapted from Wallace, 2004)

Although the straightforward comments by Wallace presented above might be exaggerating, there can also lie much truth in them. For instance many other pieces of literature present S&OP as an intermediary between strategic and detailed planning due its position in manufacturing planning control (MPC) systems. As can be seen in *Figure 2* S&OP has been argued to lie in the middle of strategic, functional and detailed planning. Its purpose can be understood through analysing the figure and seeing it as a process that integrates marketing, resource, financial and demand planning into a common plan that also recognises strategic objectives of the company. In other words, it should tie the company's high-level business and strategic plans to the operations of each department (Proud, 2007).



Figure 2: Key linkages in sales and operations planning (Volman et al. 2005)

According to Vollman (2005) the chain from strategic and operational planning to the execution gets generated when a linkage from S&OP to the MPC systems is created. He argues that the most fundamental linkage is that to the master production schedule that is a disaggregation of the operations plan. In more detail, he means that the operations plan normally stated in terms of aggregate units of output per month should be used as input when developing the more detailed master production schedule (MPS) which is stated in terms of end product units per week. Moreover, he mentions that the result drives the detailed scheduling through detailed material planning and other MPC functions.

Due to the central role of sales and operations planning it is typically regarded as the highest planning level in a manufacturing planning and control system (Olhager & Selldin, 2007; Olhager et al., 2001). It should be noted that although S&OP is connected to MPC, the process of detailed production planning is not included in the S&OP process as was discussed earlier when describing the four fundamentals of S&OP. Moreover, *Figure 2* is in line with the four fundamentals by stating that volume planning should be part of S&OP whereas mix decisions are carried out elsewhere but in connection to S&OP. Nevertheless, Palmatier & Crum (2003) empha-

size the linkage by stating that a fully integrated planning and control system should include both aggregate and detailed planning activities (Palmatier & Crum, 2003).

To summarise, S&OP can be seen as the driver, the windshield, the dashboard and the steering wheel whereas the detailed resource planning and execution systems of ERP and MRPII are the rest of the car, insuring the rubber meets the road in the right direction, in the right gear, and at the right speed (Dougherty & Gray, 2006). Furthermore, the S&OP methodology makes up the top end of the ERP business (Sheldon, 2006).

2.4 Process phases

Many articles, books and research have addressed sales and operations planning process (see *Appendix 1*). Although the contents of S&OP project phases are quite similar to each other between different literature sources, there are some differences in how the tasks are categorised in separate process phases. The following chapters will present the phases mainly as they are described by Dougherty & Gray (2006). Moreover, it should be acknowledged that Wallace (2004) has described the process in a very similar way. The process comprises five phases which represent data gathering & review, demand planning, supply planning, partnership meeting and executive meeting as the final step of the process. Nevertheless, it should be acknowledged that especially many smaller companies combine pre-S&OP meeting and Executive S&OP meeting (see e.g. Dougherty & Gray, 2006).

2.4.1 Data gathering and review

The first step of S&OP is basically just in place to prepare relevant information for use in other phases of the process. Much of the activity is claimed to occur within the information systems department. It consists of four elements:

- Updating files with data from the month just ended – actual sales, production, inventories, and so on.
- Generating information for sales and marketing people to use in developing the new forecast. This could include sales analysis data, statistical forecast reports,

key performance indicators (KPI's) on demand, service level data, inventory levels and worksheets for field salespeople.

- Generating information for supply chain, planning and manufacturing people to use in reviewing and updating supply plans. This could include actual production and purchasing data, KPI's with respect to supply, capacity information and inventory numbers.
- Disseminating this information to the appropriate people.

Often information is maintained at SKU level but since S&OP is about managing volume, this data is presented in a smaller number of S&OP families while the item-level mix will be managed by the detailed forecasting and master scheduling processes.

2.4.2 Demand planning

The second phase of sales and operations planning deals with generating a baseline demand forecast for the offered products. This is where people in sales review the information they received from Data gathering phase, analyse and discuss it, and generate the new management forecast for the next twelve or more months. This forecast must include both existing products and new products so that the supply side of the business is able to make appropriate plans. According to Dougherty & Gray (2006) this helps to avoid painful surprises such as:

- not being able to meet revenue goals or financial commitments that were predicated on the new products
- impacting other existing product line, which may share critical resources or materials with the new product
- unplanned overtime and premium freight charges to rush the new product out at the last minute
- shortages and delays in getting the new product to customers, after it is been introduced to the marketplace

In addition, Grimson & Pyke (2007) and Mentzer & Moon (2004) present that the updated demand forecast must be unconstrained meaning that it only recognises the demand side of the business while any other constraints such as production capacity are neglected. Nevertheless, there should be a two-way connection between demand planning and supply planning already at this point at least because of two things. First, Mentzer & Moon (2004) argue that supply side employees can be invited to the meeting purely as observers. Second, Dougherty & Grain (2006) present that demand planning phase should include determining future customer needs and propose changes to inventory targets.

According to Grimson & Pyke (2007) demand forecasts are usually best made in units and then translated into monetary terms in order to enable adjusting plans to meet the business objectives. Moreover, they argue that people from Finance should be involved in this to help the responsible managers compare, validate and reconcile the latest forecasts to the company's financial targets and plans. Due to these reasons Wallace (2004) presents that participation of Finance is very valuable at the demand planning phase.

2.4.3 Supply planning

The first step in the supply planning phase is to modify the supply plans for any families or sub-families that require it based on changes in the size of the customer order backlog, the sales forecast, inventory levels, or material and capacity available. Moreover, Wallace (2004) presents that changes in the sales forecast, inventory levels or the size of the customer order backlog can trigger a change to the operations plan. On the other hand, if everything has went according to plans there should be no reason to modify the plan made in the previous month rather than add one month at the end of the forecast. Outputs of the supply planning phase include a high-level supply plan (Mentzer & Moon, 2004), information on future capacity issues, including any impact of new product development trials, testing or sample production, on standard manufacturing resources (Dougherty & Gray, 2006).

2.4.4 Partnership meeting

The fourth phase of S&OP process is basically a meeting in which people from different functions get together to discuss and to form an integrated plan. Their job is to do a family-by-family

review of the updated sales and operations plans and to make adjustment, check for resource constraints and, where found, establish demand priorities by product, market and customer. This phase is often called with some other names as for instance Wallace (2004) calls it pre-S&OP meeting in order to illustrate that its aim is to make preparations for the actual S&OP executive meeting. Objectives of this meeting include:

- discussing, challenging, and validating the demand and supply plans, and the assumptions that underlie them,
- making decisions regarding the balancing of demand and supply,
- reviewing progress on action items assigned in the previous meeting,
- resolving problems and differences so that, where possible, a single set of decisions or recommendations can be presented to the executive meeting,
- indentifying those areas where agreement cannot be reached, and developing, where appropriate, scenarios showing alternate courses of action to solve a given problem (for example, sales wants an immediate supply plan adjustment requiring premium air freight and overtime expense to preserve service level, while operations wants to phase in a capacity increase to minimize costs, using up safety stocks to keep the service level high), and
- setting the agenda for the executive meeting and determining how each issue will be presented

Especially interesting from accounting perspective is that an updated financial view of the business is mentioned as one of the outputs of this meeting (see both Dougherty & Gray, 2006 and Wallace, 2004). This will be further discussed in *Chapter 3*.

2.4.5 Executive meeting

During the executive meeting senior management offer direction, decision, prioritisation, and information to help resolve any issues or gaps (Bower, 2005). Ideally, they only review and approve the work from the earlier stages and grant authority to implement planning decisions (Grimson & Pyke, 2007). According to Dougherty & Gray (2006) its objectives are:

- To approve or make decisions on each product family: accepting the recommendations from the partnership meeting team or choosing a different course of action
- To authorise changes in production or procurement rates, where significant costs or other consequences are involved
- To compare the dollarised version of this latest set of plans to the business plan and where they deviate, decide to:
 - i. Initiate changes to sales, marketing, production, procurement or product development tactics and activities to bring the plans back in balance, and/or
 - ii. Adjust the demand or supply plans, and/or
 - iii. Adjust the business plan, as appropriate
- To “break the tie” for issues where the partnership meeting team was unable to reach consensus
- To review customer service performance, other critical KPI’s, new product issues, special projects, and other issues – and make the necessary decisions

Summary of the S&OP process described in earlier chapters is depicted in *Figure 3*.

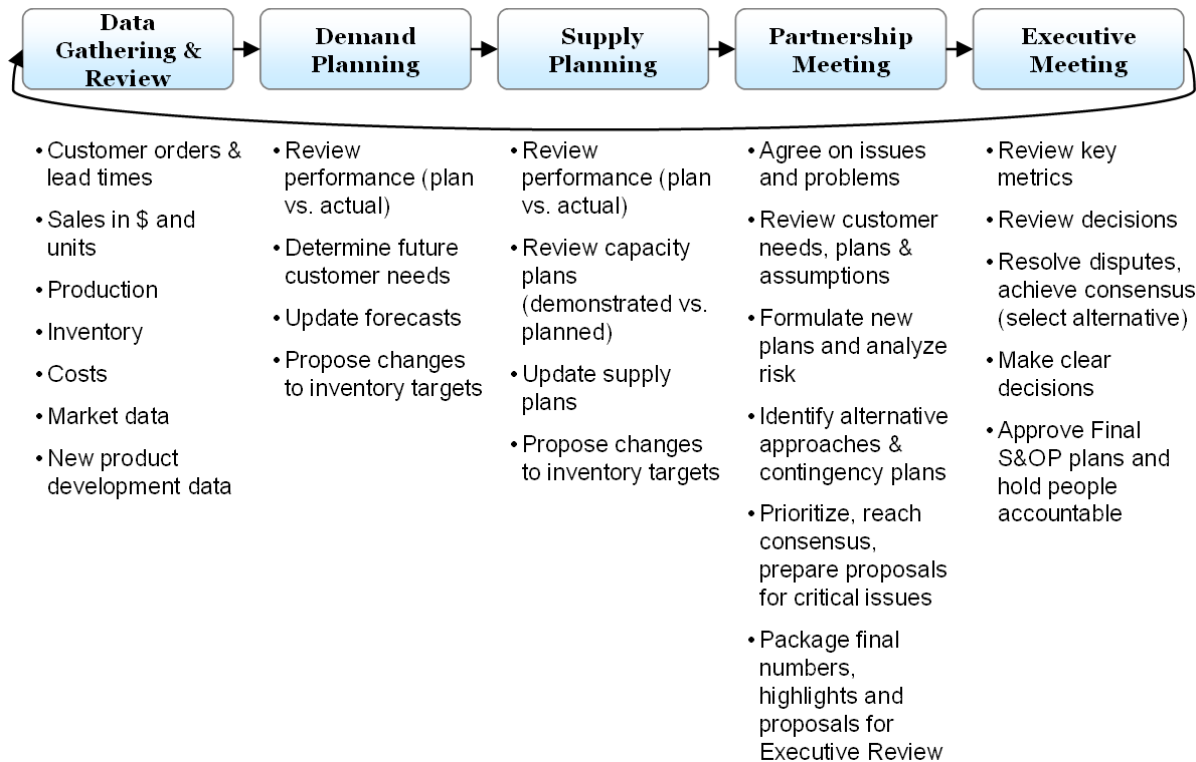


Figure 3: Summary of S&OP process (adapted from Dougherty & Gray, 2006)

2.5 Effects of the process

Before going into the analysis of including Finance in sales and operations planning, expected effects of the process will be discussed. Moreover, it has been argued that balancing supply and demand should be self-evident and pure common sense to every company because it helps to utilise resources and potential to the fullest. The effects will be discussed both from theoretic and empiric viewpoints in order to offer a broad outlook into the discussion of S&OP effects.

Due to the fact that profit optimisation has been presented as the main objective of S&OP (see Grimson & Pyke, 2007) it can be argued that S&OP should accelerate performance when operated well. Moreover, this may be achieved through better inventory management since according to Mark (2004) an efficient S&OP process is assumed to result in optimised inventory levels and increased customer service levels caused by higher product visibility. Moreover, according to Mentzer and Moon (2004) the goal of sales and operations planning is to meet financial goals

through iterating supply and demand which reflects that S&OP might lead to better utilisation of assets. Similar goals have been presented in other pieces of literature (see *Appendix 1*). Furthermore, another interesting argument supporting S&OP benefits is given by Sheldon (2006) who points out in his book that managers who have worked with S&OP processes in their past organisations are not willing to do without the advantage once they join new organisations.

Very similarly to the effects described above, Bower (2006) presents in his article five typical value creation opportunities based on his experience with a diverse cross industry mix of clients. These opportunities are:

1. Improved forecast accuracy
2. Reduced inventory
3. Reduced obsolescence
4. Improved customer service/revenue creation
5. Improved portfolio management/New product introductions

First of all, a key driver of improvement in forecast accuracy is supposed to be the determined effort of the S&OP team to bring data, assumptions, facts, and plan deviations to the demand review discussion. As a result, improved forecast accuracy helps to assure the availability of the right product, at the right time, and at the right place. Secondly, improving forecast accuracy will certainly aid in the reduction of inventory because employees attending supply review meeting will be able to trust to the demand forecast more. Thirdly, the S&OP process reduces inventory obsolescence in part by improving forecast accuracy and by the measurement of supply planning processes. Additional obsolescence reduction can be achieved by working a portfolio management review process under the S&OP umbrella in which e.g. the discontinued SKUs are determined. Fourthly, S&OP improves customer service due to better estimations on the needed level of safety stocks. In more detail, understanding the service level required by the customers is material through impacting the amount of inventory required. Fifthly, there is more focus in portfolio management providing more visibility to the promotional pipeline to assure that supply is

available, and to challenge the underlying assumptions driving the promotional forecast. (Bower, 2006)

It seems that empiric research regarding the effects of S&OP support the ones presented in literature. Results of a study conducted by Ventana Research support the benefits discussed in S&OP literature (see *Figure 4*). Furthermore, improvements in forecast accuracy, customer satisfaction, asset utilisation and inventory value were the four most common areas where companies had gained benefits. Although the study might lack objectivity due to its commercial purpose, it provides extremely important and interesting background information for this paper. Besides, the research was carried out as a questionnaire which resulted in 470 qualified respondents of the 952 in total reflecting high answer rate and massive sample size.

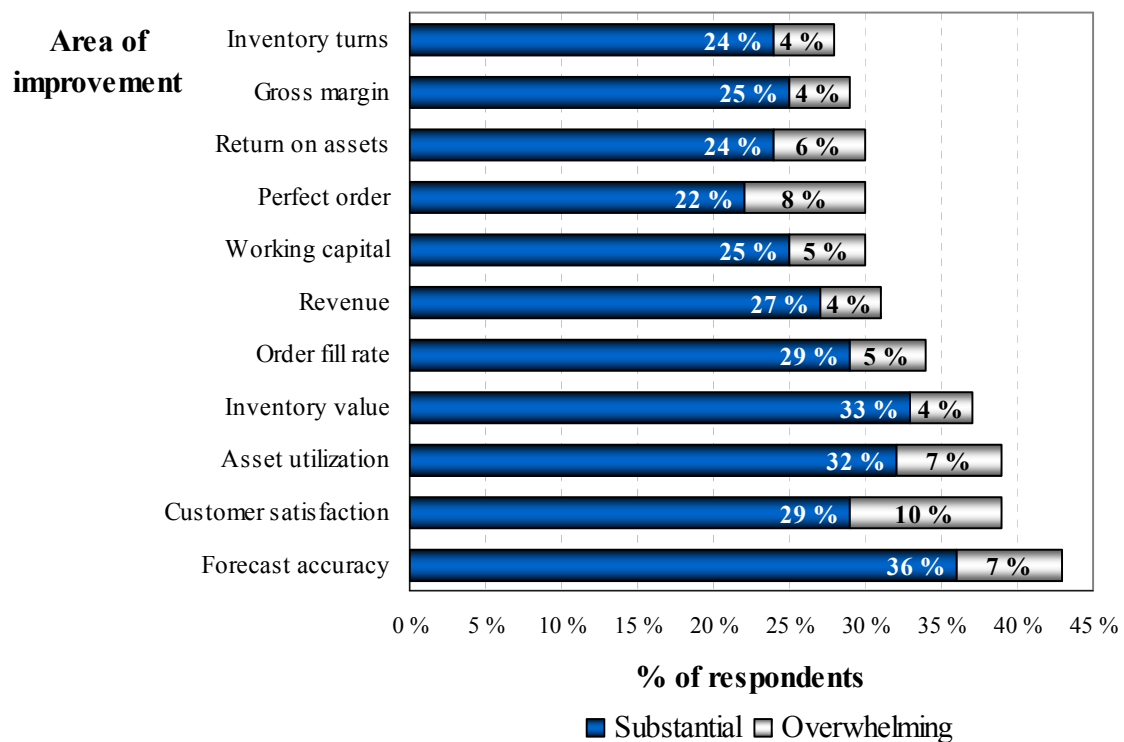


Figure 4: Benefits provided by S&OP (Ventana Research, 2006)

A research conducted by Aberdeen Group (2006) comprising more than 140 enterprises supports the findings of Ventana Research. These results are depicted in *Figure 5*. In more detail, vast majority of the respondents had gained improvements in forecast accuracy and better cross-

functional communications. In addition, remarkable portion of the respondents have been able to improve their inventory management.

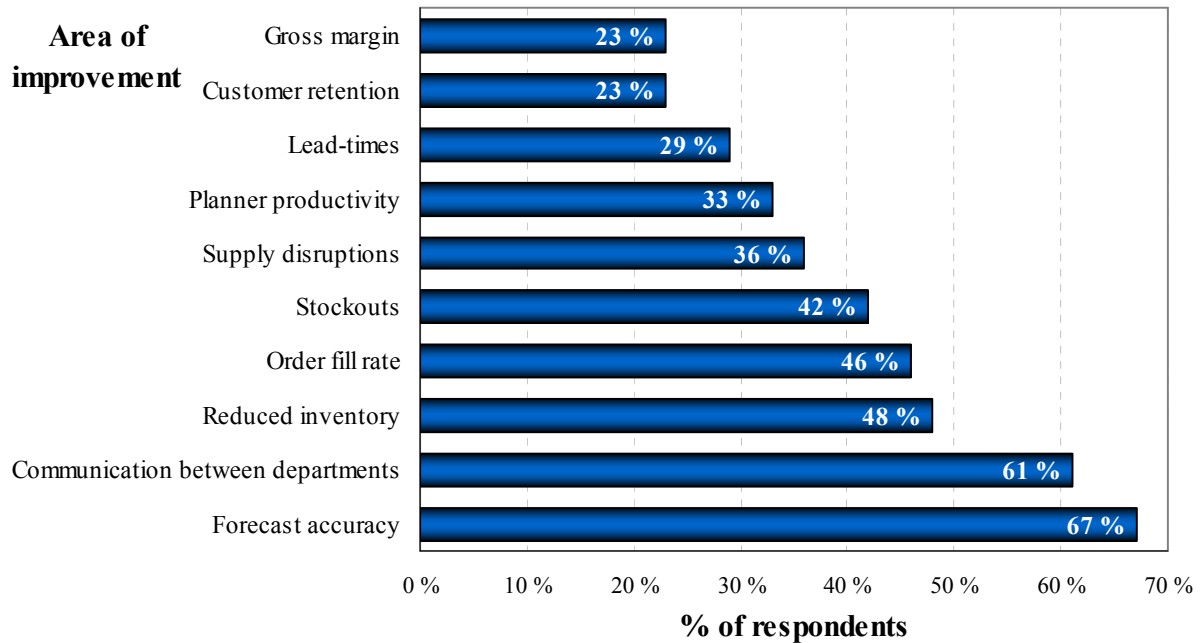


Figure 5: Benefits of existing S&OP processes (Aberdeen Group, 2006)

When comparing *Figure 4* and *Figure 5* you should keep in mind that the latter includes all levels of perceived improvements that were identified in the research whereas the earlier includes only substantial and overwhelming improvements. Nevertheless, their results robustly support benefits described in S&OP literature.

The two research, which were just presented, illustrate that only few companies have been able to see improvements in profit-related metrics such as gross-margin. As Aberdeen Group (2006) points out this is most probably due to companies being able to progress in demand and supply matching but inadequate in doing it cost-efficiently. Another reason for this could be the lack of aligning sales and operations planning with financial goals of the company. This might result in optimising individual KPIs such as inventory measures instead of recognising strategic aspects of the company and therefore leading to conciliatory profit improvements. If this point of view is valid it certainly supports including Finance in the process.

More discussion of S&OP effects can be found from e.g. Dwyer's article (2000) which presents a company that improved its inventory accuracy from 64% to 98%, supplier delivery from 62% to 95% and manufacturing performance from 62% to 95%. In addition, an academic research by Grimson and Pyke (2007) analysed the interrelation between S&OP advantageous and firm size in order to study if S&OP more practical for sizeable organisations. Despite the small sample size of the study, it discovers that there is no apparent link between S&OP maturity and firm size.

Another academic research regarding the effects is presented by Feng et al. (2008) who conducted an academic case study that evaluated benefits of well functioning S&OP by comparing financial performance of the case company in three different scenarios based on S&OP sophistication under seasonal demand and market price conditions. The simulation research concludes that the most advanced S&OP provided superior performance to the other scenarios.

To summarise, it seems that companies with a S&OP process have been able to gain benefits especially regarding forecast accuracy and inventory management. Nevertheless there seems to be still much space for improvements as only small proportion have reported improvements in financial based figures. Moreover, according to Ventana Research 65% of companies have been doing sales and operations planning for less than 5 years which reflects that many companies might still be implementing their processes.

3 FINANCE IN S&OP

This chapter focuses on Finance's role in sales and operations planning process through reviewing existing literature whereas empirical implications will be analysed later in the thesis. As was already mentioned in *Chapter 2.4* Finance is argued to have a significant role in S&OP process since it is needed to better understand the financial impacts of the sales and operations plans (Wallace, 2004). Moreover, it was mentioned that S&OP involves reviewing the key metrics. Since understanding the consequences of measurement structure has been regarded central to accounting scholarship (e.g. Kinney, 2001), Finance clearly has a significant role also regarding performance measurement in S&OP.

3.1 Participation and role

When discussing how Finance can support S&OP, an inherent starting point is to analyse what role and in which phases Finance could participate in S&OP. Moreover, if it is not included in the process at all, it becomes impossible to robustly support it neither. It has been presented that a mature S&OP process should be led by Finance people in order to ensure that the plans reflect the needs of the stockholders (Dadmun in Parker, 2008). On contrary, many other pieces of literature present that there is no common rule for who should be nominated as the S&OP Leader. For instance, Wallace (2004) mentions that it is best to select S&OP process owner and executive champion from different departments in order to avoid sending a message of a process that belongs only to a certain business function. In addition, he presents that S&OP has been led in real life by Director of Sales Administration, Demand Manager, Supply Chain Manager, Materials Manager, Controller, Sales Manager and Materials Manager.

Although there is no certainty who should lead S&OP, it is by far a common view that Finance should be included in the process (see e.g. Wallace, 2004; Dougherty & Gray, 2006; Grimson & Pyke, 2007). Furthermore, when key Finance staff members are involved in the process, they are supposed to provide actionable data that makes it much easier to promptly shift away from a less profitable product (Mentzer & Moon, 2004).

In addition to theories, also empiric research seems to support the view of including Finance in S&OP. In fact, Ventana Research (2006) concludes that 42% of all companies include Finance in their sales and operations planning process. The finding that less than half actually do this seems relatively low compared to the vast amount of S&OP literature that supports including Finance in the process. Nevertheless, interesting is that the same study reports that 90% of companies with overwhelming gains in revenue did include Finance in their process. Although this seems very promising as it implies that including Finance in S&OP would improve the process, it should be acknowledged that only 4% of all companies under review reported overwhelming revenue gains meaning that the sample size for the category is as low as 19 companies. In addition, 70% of companies reporting gains in gross margin, 56% reporting gains in forecast accuracy and 76% reporting gains in customer satisfaction included Finance as part of their S&OP process. It must be acknowledged that the research is not able to prove that including Finance in the process was the only reason for the reported improvements in these performance indicators. Moreover, it could be argued that the ability to include Finance in S&OP reflects sophisticated procedures in general, thus resulting in a positive performance gap compared to other companies. On the other hand, mere Finance participation does not guarantee performance improvements whereas it depends on the impact it brings to the process. The following chapters will therefore focus in more detail on the things that Finance is supposed to support in sales and operations planning.

3.2 Financial reconciliation

Unlike the overall business plan of the company which is stated in financial terms, S&OP is argued to speak in the language of sales and manufacturing: forecasts, bookings, production, units, hours, and so on (Proud, 2007). According to Lapide (2007) Finance's natural role in a S&OP process is to tackle this challenge through monetising the demand and supply plans developed by others so that everyone can see the future financial picture vis-à-vis the financial plans and budgets in place. In addition, also many others such as Dougherty & Gray (2006) argue that S&OP should include financial reconciliation. In fact, Ventana Research (2006) concluded in their research that alignment of financial plans with sales and operations plans is the single most significant factor contributing to performance improvement among companies running S&OP. In con-

clusion, the main reason for suggestions to convert sales and operations plans into financial terms seems to be to enable reviewing S&OP with the overall business plan of the company.

3.2.1 Frequency of financial reconciliation

On contrary to doing financial analysis on an ad-hoc basis, theories imply that financial reconciliation should be a formal part of S&OP process (see e.g. Proud, 2007). However, providing just one view of the sales and operations plans does not necessarily satisfy the decision makers who often might want to see the expected effects of e.g. changes in raw material prices. Willingness to prepare such scenarios is most probably gaining much more interest as a consequence of the ongoing global financial crisis. For instance, Dougherty & Gray (2006) present that some companies maintain a standard “high-low” planning practice that enables either making contingency planning or at least better monitoring of the “highest possible”, “lowest possible” or “most likely” scenarios. In other words, scenarios can be developed in order to enable reacting proactively to possible disruptions in plans. While scenarios support risk management, monetised scenarios are also argued to accelerate performance optimisation through creation of several comparable plans. Muzumdar & Fontanella (2006) emphasise this by writing:

S&OP is no longer just about balancing supply and demand. It is about searching for and executing the most profitable strategy out of many possible scenarios.

The next chapter will focus more on the content of financial reconciliation.

3.2.2 Content of financial reconciliation

The fact that literature suggests focusing on product family level in S&OP (see *Chapter 2.2.2*) does not mean that financial reconciliation should be based only on product family level information. In contrast, necessary details should be available for financial reconciliation since sales and operations plans are usually first prepared at SKU level and only afterwards aggregated to product group level for reviews in S&OP meetings (see e.g. Dougherty & Gray, 2006). Put otherwise, S&OP incorporates detailed view into the plans although management focus is directed on more aggregated levels.

Many publications give real-life examples of monetised S&OP reports. It seems that most often they include the following items separately for each product family: sales revenue, gross profit and value of inventory (e.g. Harwell, 2006). For instance, a report of this kind by Wallace (2004) is depicted below in *Figure 6* and a very similar one by Dougherty & Gray (2006) in *Appendix 6*.

Figure 14-2 DOLLARIZED SALES & OPERATIONS PLAN — OCTOBER 2004																
FAMILY: SMALL CONSUMER WIDGETS (MAKE TO STOCK)										UNIT OF MEASURE: \$000						
TARGET CUSTOMER SERVICE: 98%										TARGET FINISHED INV: 10 DAYS ON HAND						
AVERAGE SELLING PRICE: \$10.00										UNIT COST OF GOODS SOLD: \$5.00						
SALES (SALES \$)	H I S T O R Y										3rd	4th	12 MO	MOS	FISCAL YR	BUS PLAN
	A-M-J	J	A	S	O	N	D	J	F	M	3 MOS	3 MOS	TOTAL	13-18	LATEST CALL	
NEW FORECAST	\$5400	\$2000	\$2000	\$2000	\$2100	\$2100	\$2200	\$2200	\$2200	\$2200	\$6900	\$6900	\$26,800	\$14,400	\$25,590	\$23,000
ACTUAL SALES	6150	2200	1950	2270											+11.3%	
DIFF: MONTH		220	-50	270											Y-T-D MARGIN %: 32.7%	33.0%
CUM	750	970	920	1190											Y-T-D MARGIN \$: \$8,368	\$7,590
OPERATIONS (COST)																
NEW PLAN	\$2850	\$1000	\$1000	\$1000	\$1050	\$1050	\$1100	\$1100	\$1115	\$1115	\$3450	\$3450	\$13650	\$7200		
ACTUAL	2610	1000	1030	990												
DIFF: MONTH		0	30	-10												
CUM	-240	-240	-210	-220												
FINISHED GOODS INVENTORY (COST)																
PLAN	\$450	\$500	\$500	\$500	\$300	\$350	\$400	\$450	\$500	\$550	\$575	\$575				
ACTUAL		78	89	60												
DAYS ON HAND		8	9	6	6	6	7	8	9	10	10	9				
CUSTOMER SERVICE		94%	96%	89%												
DEMAND ISSUES AND ASSUMPTIONS										SUPPLY ISSUES						
1. POSSIBLE ACQUISITION OF BIG MART BUSINESS NOT INCLUDED IN THIS FORECAST										1. NEW EQUIPMENT AT MIDDLETOWN PLANT TO BE INSTALLED THIS MONTH						

Figure 6: Monetised sales and operations plan (Wallace, 2004)

Noteworthy is that S&OP literature suggests monetising also inventory values in addition to sales and operations costs. Moreover, being able to predict inventory levels and their value enable to assess working capital requirements of actualising the plans.

Some companies go way beyond gross profit level as they fully integrate S&OP with financial forecasting and thus monthly prepare a completely updated financial view of their businesses. For instance, two case companies in Dougherty & Gray's (2006) book operate in line with this prac-

tice. Moving from gross profit level to operating profit level most often requires forecasting costs that might not be directly linked with S&OP thus adding much complexity to financial reconciliation. For instance, discretionary items such as research, development, advertising, promotion, training, and, of course, strategic initiatives do not bear a tight causal relationship with sales and operating levels, and therefore requires a parallel calculation along with the updated revenue forecast (Kaplan & Norton, 2008). The spending on such discretionary items remains a judgment call by experienced executives, and not a decision that can be automated through an analytic model (Kaplan & Norton, 2008) therefore meaning that they will have to be separately forecasted if a complete financial view is going to be prepared during sales and operations planning process.

An important step in the overall financial integration is to aggregate all the monetised product family information into one view of the entire business. Obviously, this can't be done completely until all product families are included in S&OP. And even then some information might be missed because of revenue streams that are outside the array of product families. One approach in such cases that's proven helpful is to create a "Miscellaneous Family" to serve as a collector for atypical streams of income. Other way is just disregarding these kinds of things and compare the total sales projection (cut of S&OP) with a business plan number adjusted to exclude the miscellaneous incomes. (Wallace, 2004)

It should be acknowledged that even a relatively minor change to a single product line could cause changes throughout the entire set of financial plans including revenue, profit margins, product costs, overhead allocations, selling and administrative costs, and departmental operating budgets (Dougherty & Gray, 2006). Although this thesis is not focusing on how these calculations should be prepared, it should be acknowledged that preparing a full P&L as part of S&OP most probably requires a sophisticated financial forecasting procedure that enables to do it in an efficient way. Moreover, one method that many suggest using is driver-based planning such as activity based budgeting (ABB) to enable forecast costs and expenses through deriving them directly from the sales forecast (e.g. Kaplan & Norton, 2008 ; Sandison et al., 2003). In fact, ABB can work very well with S&OP since it starts with planning the volumes and then assigns the

costs (Cooper & Kaplan, 1992). The ABB method is depicted in *Appendix 5* but will not be discussed more here since it is out of scope of the thesis.

In addition to P&L and B/S items discussed above, some literature emphasises the importance of cash flow analysis as part of S&OP. For instance, Proud (2007) argues that S&OP should include estimating the financial resources needed to implement the demand and supply plans. Furthermore, Burrows (2007) imply that cash flow should be included by mentioning the following about Finance's responsibilities in S&OP:

Finance must become less focused on traditional profit and loss (P&L) and concentrate instead more on understanding cash flows and cash performance, which requires a much more sophisticated analysis. The traditional P&L focus ignores the equilibrium among capacity utilisation, inventory management, and cash velocity.

It is by far common sense that there should be a connection from S&OP to cash management e.g. due to the fact that inventory management generally plays an important role in both S&OP and cash flow analysis. However, the focus should probably be rather on significant exceptions than in detailed cash balances. For example, it could be reasonable to assess cash needs arising from purchasing a new facility where as there would be only little sense trying to balance each receivable and liability for the next 18 months in accordance to S&OP. Moreover, value of inventories was included in the monetised S&OP report depicted in *Figure 6* and thus illustrates including high level estimation of working capital requirements in S&OP.

3.2.3 Strategic alignment

As has been already mentioned, one main objective of S&OP is supposed to be connecting strategy to operations. Nevertheless, Bower (2005) names the disconnection between S&OP and corporate strategy as the number one threat to an effective S&OP process across companies of all sizes and types of industries. To close this gap, S&OP theories place crucial expectations on Finance in order to integrate the established operational plans with the financial targets of the company (Saarinen, 2008; Tohamy, 2008); reconcile the S&OP related sales, gross profit, and inventory plans with the corporate financial strategy (Harwell, 2006); and determine gaps to budget and engage the organisation in gap-closing activities (Bower, 2006). In other words, theories em-

phasise the importance of converting S&OP into financial terms in order to establish alignment between the plans, strategy and company objectives.

If S&OP is not in line with the company's business plan something should obviously be done. If they are not changed when they differ from the business plan the company is in danger of going to operate misaligned with its strategy. Moreover, Wallace (2004) presents that this kind of situation creates confusion, accelerates lack of control, diminishes the importance of plans and increases the risk of not hitting the business plan. There are basically two options if the developed sales and operations plans and the business plan do not meet. First, sales and operations plans may be changed through e.g. offering promotions, changing pricing or by introducing new products. Second, the business plan may be changed. Nevertheless, this creates problems if the business plan has been validated at a higher corporate level. (Wallace, 2004)

Dougherty & Gray (2006) imply that most often it is easier to adjust S&OP rather than change the business plan as it often requires lots of work. However, they also mention that extreme shifts in sales volumes or supply situations might require adjustments in the business plan much more rarely than each month. Changing the business plan might not be a sufficient action unless the business is facing some major unforeseen issues. Otherwise, changing the business plan might become a topic in every S&OP round. Moreover, quite often incentive plans are tied to business plan which adds new flavour on the discussions of changing the plan.

When discussing strategic alignment and S&OP in the same context, it is good to understand two separate implications. First, S&OP is argued to enable reviewing that operational plans are aligned with strategic aspirations. Second, S&OP provides feed-back for strategic planning by giving a reflection from the shop-floor level. These aspects of S&OP are further illustrated in *Figure 7* that builds on *Figure 1* by emphasising the two way information flow that S&OP captures. Moreover, Dougherty & Gray (2006) argue that S&OP provides a more reliable and rigorous process to replace or provide input into the traditional business performance reviews that most top management teams conduct on a monthly basis.

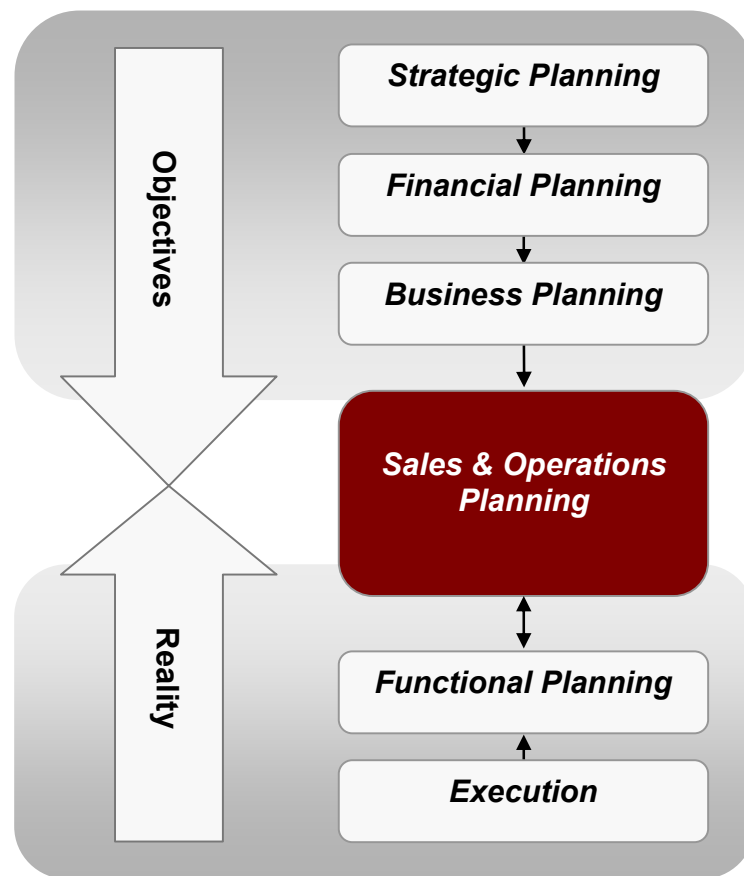


Figure 7: S&OP as a medium for strategic alignment and execution feedback (adapted from Wallace, 2004)

The fact that some companies have abandoned traditional budgeting does not mean that they would face enormous challenges when trying to assess strategic alignment of sales and operations plans. Although Bower (2006) discusses about making the alignment through comparison to budget it should be acknowledged that it can as well be done through performance measures.

3.2.4 Implications for budgeting and rolling forecasting

Since S&OP theories suggest preparing an updated financial view of operational plans each month, they are strongly connected to the beyond budgeting discussion which has criticised the purpose of traditional budgeting and emphasised monthly or quarterly rolling forecasts as the main alternative (e.g. Hope & Fraser, 1999). Moreover, S&OP seems to offer a rigorous process for rolling forecasting since it comprises a logical process starting from integrating demand and operations plans and building a financial view on top of them. In fact, Marvin Jarvis who is VP of

global S&OP for Unilever points out that S&OP has enabled them to start get rid of fixed budgets and formal allocations through planning on more of a rolling basis (in *Manufacturing Business Technology*, 2007).

Critics of traditional annual budgeting have presented many reasons for moving to planning at more rapid time intervals. Hope & Fraser (1999 & 2003), aside many others, argue that traditional budgets reinforce the command and control culture, constrain freedom and autonomy, direct management attention exclusively to short-term financial numbers and ignore shareholder value. In addition, it often requires excessive time and money, motivates managers to make easily achievable estimates, stifles innovation and becomes obsolete in a rapidly changing, globally competitive business environment (Kaplan & Norton, 2008). On the other hand, Ekholm & Wallin (2000) argue that the budget has lost its active strategic role since they focus on maintaining internal effectiveness and fall short in ability to aid in value creation based on superior external effectiveness that has recently become extremely important in today's business environment. Nevertheless the critique that have been put on traditional budgeting, Ekholm & Wallin found in their study with a sample size of 168 companies that over 85% of companies still intend to hold on to the annual budget. However, they also found that companies tend to view rolling forecasts favourably and that many companies preparing rolling forecasts seem not to have abandoned budgeting but run them parallel with annual budgeting.

It should be acknowledged that most of S&OP literature seems to support the view of not abandoning budgeting totally after including financial reconciliation in S&OP. Moreover, according to Dougherty & Gray (2006) many companies use S&OP information as the basis when updating their business plans. They imply that companies with S&OP have better starting point for fiscal year budgeting since reasoned operational plans diminish the amount of iteration required to achieve acceptable level for the budget. As a consequence, they also present that many companies have been able to reduce the number of hours people need to put into the annual financial budgeting process by as much as 50% when S&OP is used as the starting point. In contrast, Åkerberg (2006) presents that many organisations have ended up with a heavy forecasting process due to their inability to separate forecasting and operational budgeting.

Although there are academic research about budgeting and rolling forecasting, they currently fail to robustly distinct varying methods of conducting them. For instance, Hansen & Van der Stede (2004) found in their survey that performance of operational planning increases with the use of rolling forecasts, thus also supporting the main idea of S&OP. Nevertheless, they did not examine whether the companies included in the study based their financial forecasts on operational plans or simply did it as a Finance exercise through adjusting actual financial figures.

3.3 Performance measurement

From accounting point of view it is interesting to discuss the purpose of performance measures in S&OP which in fact is not given too much focus in S&OP literature itself. Performance measurement will be first briefly discussed generally in order to provide a sufficient understanding for the later section focusing on their connection to S&OP.

3.3.1 General purposes of performance measurement

Performance measurement is usually regarded as being part of a broader management control system that executives utilise to run their company in order to achieve their objectives. Moreover, Malmi & Brown (2008) understand management controls as those systems, rules, practices, values and other activities that management use to direct employee behaviour. According to their typology management control system includes planning, reward and compensation, administrative and cultural controls in addition to cybernetic controls which include budgeting and measurement (see *Appendix 2*). This reflects the fact that companies may manage their business in varying ways by emphasising separate management controls in differing ways. As a result, there can be distinguished many different purposes for using performance measures.

One way of understanding purposes of performance measurement is to look at how they are utilised. Furthermore, Eckerson (2006) argues that performance management system should communicate strategic objectives and enable business people to:

1. **Monitor** critical business processes and activities using metrics of business performance that trigger alerts when potential problems arise.

2. **Analyse** the root cause of problems by exploring relevant and timely information from multiple perspectives and at various levels of detail.
3. **Manage** people and processes to improve decisions, optimise performance, and steer the organisation in the right direction.

The above functionalities of performance measurement illustrate that the purpose might not be only to distinguish arising problems and to find reasons for them but also to manage organisation through making people responsible of certain measures. In other words, performance measures can be utilised in both managing people and to support decision making.

3.3.2 Types of scorecards

In consistence with several ways of using performance measures, companies also use several types of scorecards. For instance, Kaplan & Norton (2001) distinguish three kinds of scorecards that companies use in practice: key performance indicator (KPI) scorecards, stakeholder scorecards and strategic scorecards. First, **stakeholder scorecards** focus on the most material stakeholders of the company such as owners, customers, employees and suppliers. Often each stakeholder has their own scorecard which measures how well the company succeeds in reaching the objectives from their viewpoint. The main problem with these kinds of scorecards is that they focus on reaching the objectives and disregard the ways these objectives are going to be achieved. Second, **KPI-scorecards** include measures that are important to the way the organisation operates. However, they tend not to reflect strategy since often they focus on distinct action areas and disregard interconnection between them. Third, **strategic scorecards** are based on the cause-and-effect relationships between individual measures and action areas and therefore should represent company strategy. Kaplan and Norton's balanced scorecard (BSC) has probably evolved to the best known example of a strategic scorecard, although it initially might have lacked strategic aspects. Moreover, it should be mentioned that Speckbacher et al. (2003) found in their research regarding companies in German-speaking countries that only half of the companies having experience of BSC were able to formulate cause-and-effect relationships among the different objectives and measures. This partly speaks for the difficulty of linking performance

measurement to strategy since Kaplan & Norton (1996) describe strategy as a set of hypothesis about cause-and-effect.

Eckerson (2006) has a very similar approach with Kaplan & Norton (2001) in categorising scorecards as he distinguishes operational, tactical and strategic scorecards. **Operational dashboards** monitor core operational processes and are used primarily by front-line workers and their supervisors who deal directly with customers or manage the creation or delivery of the organisation's products and services. **Tactical dashboards** track departmental processes and projects that are of interest to a segment of the organisation or a limited group of people. Managers and business analysts use tactical dashboards to compare performance of their areas or projects, to budget plans, forecasts, or last period's results. **Strategic dashboards** monitor the execution of strategic objectives and are frequently implemented using a Balanced Scorecard approach, although Total Quality Management, Six Sigma, and other methodologies are used as well. The goal of a strategic dashboard is to align the organisation around strategic objectives and get every group marching in the same direction. To do this, organisations often roll out customised scorecards to every group in the organisation and sometimes to every individual as well. These cascading scorecards, which are usually updated weekly or monthly, give executives a powerful tool to communicate strategy, gain visibility into operations, and identify the key drivers of performance and business value.

3.3.3 Review of performance measurement research

Focus of academic research on performance measurement has varied a lot depending on the point of time. Chenhall & Langfield-Smith (2007) emphasise in their literature review that there exists major diversification both in the uses of performance measurement and academic research concerning them. They argue that although management accounting has had a primary role in developing performance measures to assist managers in planning and controlling their organisations, managers from other functions such as operations, marketing and human resource management have sought to develop measures of greater relevance to their own areas of management. As a reflection, academic research regarding performance measurement can be found from a wide array of literature. Nevertheless, Chenhall & Langfield-Smith imply that strategic performance

management systems, such as the BSC, have been able to make at least some kind of integration resulting in assessing performance measurement as whole rather as a functional control tool.

There is however also a drawback in the growing popularity of assessing performance measurement through a broader strategic approach such as the BSC. Moreover, Ittner & Larcker (2001) argue in their literature review which deals with empirical research in managerial accounting that the advent of new topics such as the balanced scorecard has substantially reduced research at the interface of accounting and operations management. They say that this has left us with an underdeveloped body of research that fails to build on prior studies to increase our understanding on distinct topics. For instance manufacturing performance measurement gained lots of interest especially during the 1980s but has thereafter lost its interest (see e.g. Kaplan, 1990). As a reflection, this research discusses how companies use measures and scorecards in their S&OP processes aside strategic measurement.

3.3.4 Performance measurement in S&OP

Measurement has been acknowledged as one of the aspects required from an ideal S&OP process (see e.g. Lapide, 2004 & Lapide, 2005b). In fact, Sheldon (2006) presents that metrics are one of the most important drivers within S&OP. According to Vollman et al. (2005) the value of sales and operations planning becomes certainly questionable if there's no monitoring of performance. Nevertheless the encomium of using performance measures in S&OP, it has been argued that their use is often a new concept when the S&OP meeting first gets off the ground in an organisation (Sheldon, 2006). Moreover, Vollman et al. (2005) present that it is an unfortunate but frequent approach to invest management time in the sales and operations planning activity but thereafter allow the company to be run by a separate performance measurement system.

Taking a holistic look, sales and operations planning can be greatly affected by performance measurement. In accordance with Kaplan & Norton's illustration of management system (2008, see *Figure 8*), there can be distinguished at least two viewpoints for their role in S&OP: strategic and operational. First, the fact that **strategic scorecards**, discussed in *Chapter 3.3.2*, ultimately aim at directing action, often through building personal responsibility, to achieve competitive advantage reflects in that performance measurement affects planning activities of people being

responsible of certain strategic initiatives. In other words, the purpose of strategic measures is to guide people to operate and plan their operations aligned with the overall strategy, thus also indirectly affecting activities done during S&OP. Second, **operational dashboards** may be used to provide feedback on local process performance. As will be later presented, theories suggest using operational dashboards directly in the S&OP process.

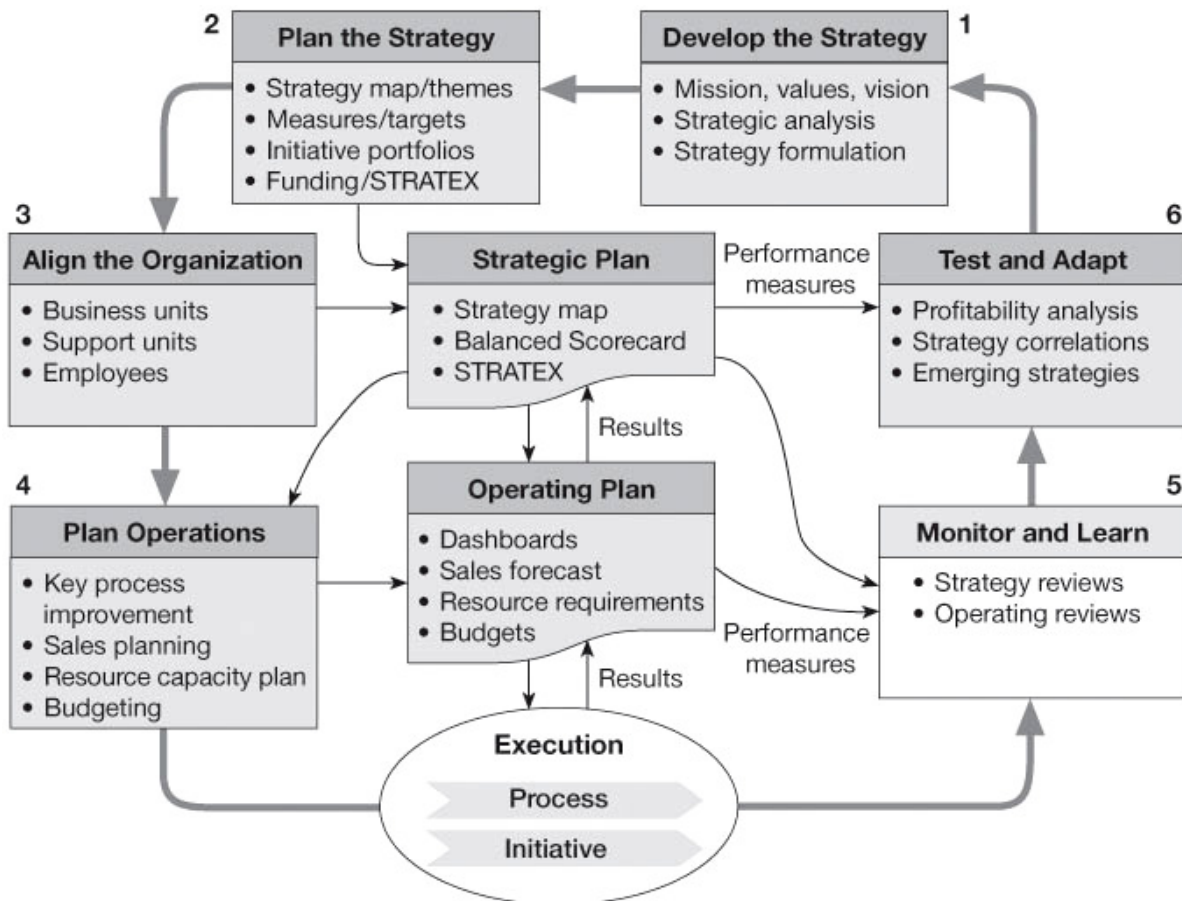


Figure 8: The management system (Kaplan & Norton, 2008)

Although S&OP should include review of actual figures it does not necessarily mean that the S&OP meetings should be integrated with strategic reviews such as one with the BSC. Moreover, Kaplan & Norton (1996) present that strategic reviews should probably be conducted quarterly since strategic factors like market share, customer satisfaction, new product introduction, and employee capabilities may not change meaningfully from month to month. In contrast, S&OP is suggested to be conducted each month and hence making a distinction from strategic reviews. In addition, Dougherty & Gray (2006) present that most companies have implemented S&OP as a

distinct meeting from other management bodies therefore also supporting the view of keeping strategic reviews and S&OP review as separate meetings. As a consequence, scorecards used in S&OP should generally focus more on operational than strategic issues.

As was presented in *Chapter 3.2.4* S&OP and rolling forecasting have some significant interfaces. Furthermore, many companies that have replaced their traditional annual budgeting process with rolling forecasting have often begun to use performance measures more extensively. Organisations from varying industries such as Ahlsell (Hope & Fraser, 2003), Borealis (Kaplan & Norton, 2008) and Handelsbanken (Lindsay & Libby, 2007) are well known examples of this. Furthermore, it has been argued that key performance indicators, which tend to be financial at the top of an organisation and more operational the nearer a unit is to the front line, fulfil the self-regulatory functions of budgets (Hope & Fraser, 2003).

Although performance measurement often has a massive role in rolling forecasting, discussion in S&OP context tends to focus on S&OP effectiveness. In other words, S&OP literature focuses on the scorecards that could be used in the actual S&OP meetings rather than the overall performance management systems that are used to manage strategic intentions of the company. To illustrate this discussion, the following chapter focuses on literature regarding S&OP scorecards and its specific measures.

3.3.5 S&OP scorecard

In addition to strategic performance measurement, companies have been presented to include a separate S&OP scorecard in their sales and operations planning processes (e.g. Bower, 2005; Ventana Research, 2006). An academic research by Grimson & Pyke (2007) supports this view by concluding that using measures focused in planning activities is a very strong enabler of overall S&OP integration.

Historically, metrics have been specific to a single function (such as sales forecasting accuracy) and involve volumetric types of measurement (such as actual vs. planned sales volumes) (Muzumdar & Fontanella, 2006). Furthermore, measurement of planning accuracy is still greatly emphasised in S&OP literature. For instance, according to Wallace & Kremzar (2001) S&OP meas-

ures should focus on actual performance to the plan; forecast accuracy in other words. Also Lapide sees the importance of forecast accuracy by presenting demand planning accuracy as the most important measure to be used in S&OP. However, Lapide also presents that metrics should include more than the typical forecast errors, and include measures such as variance to baseline forecasts & budgets and the adherence to prior sales, marketing, and operations plans.

One reason for the importance of forecast accuracy is making visible biases of plans after actuals have been reported. Moreover, it should be common sense that it becomes easier to get a buy-in from operations to the demand forecast if marketing and sales have been able to prove their planning abilities with good accuracy rates. Moreover, Sheldon (2006) argues that profitability can be a direct result of good planning since it avoids acute action within short notice. In addition, forecast variance should be easy to calculate and acknowledges also over beating the plan. Sheldon recommends using business planning accuracy, demand planning accuracy, and operations accuracy. Nevertheless, he suggest reporting them at product family level and using deliver on time or data accuracy measures to get more detailed information out of the figures.

The significance of assessing planning accuracy in S&OP is well illustrated by Vollman et al. (2005):

A special responsibility in sales and operations planning involves control of performance against the plan. As a prerequisite to control, the sales and operations planning process should be widely understood in the firm. The seriousness with which it's regarded should be communicated as well as the exact planned results that pertain to each of the organisation's functional units. In other words, the planning process must be transparent, with clear communication of expectations, to control actual results. Performance against the sales and operations plans should also be widely disseminated. When actual results differ from plans, the source of these deviations must be analysed and communicated.

According to Muzumdar & Fontanella (2006) the drive for competitive advantage, however, has spurred a rethinking of what metrics should be used to determine the success of the S&OP program. They argue that the emerging best metrics, such as gross margin, encompass the two-way impact of demand and supply decisions, rather than having separate and unrelated metrics for each. Moreover, they present that KPIs that should be used are related to value chain processes,

product and customer profitability, order fill rates, customer satisfaction or retention, sales per employee, percent volume growth, and gross margins.

Muzumdar & Fontanella's viewpoint is supported up by Whisenant (2006) who presents that performance metrics used in S&OP should be linked to revenue, forecast accuracy, service, inventory, supply chain costs, margins, and cash-to-cash cycle. Moreover, for a S&OP program to succeed over the long term, companies should consider how performance measurement itself must change. This means putting new metrics into place as business conditions change as well as increasing the frequency of reporting and analysis (Muzumdar & Fontanella, 2006). Furthermore, Vollman et al. (2005) present that Tennant Company has been able to not have missed a quarterly operations plan for the previous 2,5 years by using certain operational measures in their S&OP in addition to forecast accuracy. These measures include:

- Conformity of the master production schedule to the operations plan
- Capacity utilisation
- Delivery performance
- Actual production to master production schedule performance
- Inventory / backlog performance

According to Grimson & Pyke (2007) measurement is essential, both for implementation and for continuous improvement of S&OP. They present that the chosen S&OP measures should vary by industry, process, and product line. In addition, they present commonly used measures that are utilised in reviewing efficiency in S&OP separately for each organisational function included in the process. Examples of commonly used measures for operations include line fill, inventory on hand, obsolete inventory, expediting frequency, stockouts, variance to standard cost, quality, and capacity utilisation. When new product introduction is important, measures include development cost, time to market, ramp-up time, and number of successful introductions. Measures for the sales team include top line sales growth, market share, forecast accuracy and variance to baseline forecast. Finance is most interested in business measures such as market share, sales dollars, stock price and return on invested capital. Nevertheless, they mention that measures for S&OP effectiveness are very rare in practice nevertheless their importance. (Grimson & Pyke, 2007)

An empiric touch to utilising measures in S&OP is given by Rajala (2008) who examines in his research the role and use of performance measures and balanced scorecards in an operations organisation. Rajala presents in his research a company that has separate scorecards for S&OP and strategic performance measures. In more detail, the company includes availability figures by unit, planning accuracy of volume and mix, and inventory turnover in their S&OP scorecard which is distinct from the strategic scorecards that the company uses. Moreover, the basic problem with the S&OP scorecard is claimed to be lack of ownership and responsibility of the measures. This has led in some collisions within the company due to the fact that for instance forecast error made by the sales department also affects production since it might impact their availability measures.

As was illustrated in Rajala's research, measuring S&OP effectiveness clearly needs an owner (Grimson & Pyke, 2007) while the KPIs should be designed to measure the performance of everyone involved in S&OP (Harwell, 2006). Moreover, Wallace & Kremzar (2001) argue that metrics, and the resultant accountability, are very important benefits of S&OP, thus also reflecting the importance of establishing responsibility of the measures. Besides, publishing S&OP scorecards is argued to force the decision makers to address problems (Bower, 2005) as it provides a tool for discussion. Furthermore, Vaivio (2004) illustrates in his article how focused non-financial measurement can bring controller closer to operational detail, stimulate horizontal debate, and lead to expert resistance.

S&OP literature has illustrated a few S&OP scorecards as examples to be used in the S&OP review. For instance, Milliken presents a scorecard that includes measures in five categories representing financial, demand, production, inventory and logistics. As can be seen in *Figure 9*, the scorecard gives lots of emphasis on planning accuracy and inventory levels which have been emphasised also in other pieces of literature as has been presented.

FIGURE 6 SAMPLE S&OP SCORECARD									
Period Ending:		KPI ScoreCard							
Business A		Previous Month	Target	Upper Limit	Lower Limit	Reporting Month		Trend	Owner
							Status	Rolling 12 Month	
Financial	Total Sales (\$M)								J. Doe
	Contribution Margin (\$ / lbs)								J. Doe
Demand	Total Demand (M lbs)								J. Doe
	Demand vs. S&OP								A. Smith
	Forecast Accuracy (Lag 1)								B. Johnson
Production	Total Production (M lbs)								E. Green
	Production vs. S&OP								B. White
	S&OP Capacity Utilization								E. Green
Inventory	Total Finished Goods Inventory (M lbs)								R. Done
	Inventory vs. S&OP								R. Done
	DII (PIT) Raw Materials								R. Done
	DII (YTD) Raw Materials								R. Done
	DII (PIT) Finished Goods								R. Done
	DII (YTD) Finished Goods								R. Done
	DII (PIT)								M. Labadie
	DII (YTD)								M. Labadie
	Non-Saleable Inventory (K Lbs)								J. Doe
Logistics	On-Time Shipping								E. Green
	Actual Ship Qty. vs. Order Quantity								J. Doe
	Total Fixed Distribution Cost (\$K)								R. Done

Figure 9: KPI Scorecard (Milliken, 2008)

Another example of a S&OP scorecard is presented by Palmatier & Crum (2003). In their opinion, performance measures for sales and operations planning should center on evaluating a company's effectiveness with markets and customers, finance and shareholders, employees and productivity, technology/innovation and product development, and internal improvement initiatives. In other words, it recognises the four aspects of BSC: financial, customer, internal process, and learning and growth perspective. Nevertheless, again lots of emphasis has been given to planning accuracy thus making a separation between S&OP and strategic scorecard. The scorecard is presented in

3.4 Theoretic summary

Based on S&OP literature there can be distinguished two main responsibilities for Finance in S&OP. First, it can take the responsibility of converting sales S&OP into financial terms or in other words take care of financial reconciliation. Second, Finance can take the responsibility of supporting S&OP through managing performance measurement. These activities are illustrated in Figure 10 below.

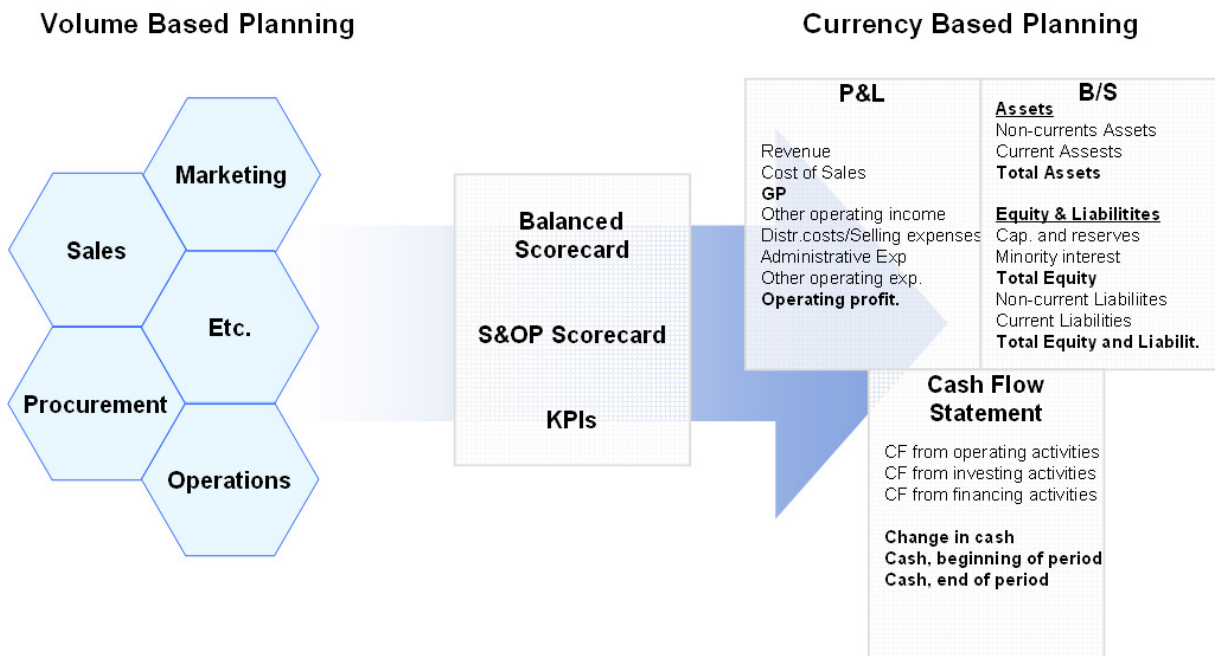


Figure 10: Incorporating performance measurement and financial view into S&OP

The fact that S&OP speaks in the language of sales and manufacturing (bookings, units, hours etc.) has been argued to create a need for integrating the different languages by converting them into monetary units in order to enable comparing with business plan (Proud, 2007). In other words, financial reconciliation of sales and operations plans should make it possible to see the financial effects of the operational plans rather than just volumes and other non-financial variables while also enabling to see the overall effects and correspondence with the strategy. Furthermore, integrating financial reconciliation in S&OP simultaneously seems to establish a rigor-

ous interface to rolling forecasting by accelerating communication from other organisational functions to Finance.

Practically all S&OP publications recommend including performance measures in S&OP since they help to identify problems and support decision making (e.g. Bower, 2005). In more detail, measurements apply to both company performance as well as the effectiveness of the S&OP process (Grimson & Pyke, 2007). While S&OP process should assure alignment of future plans with strategy, literature suggest having a separate forum for analysing how the strategy actually is implemented (e.g. Dougherty & Gray, 2006). As a consequence, literature presents strategic measurement and use of S&OP scorecards as complimentary practices. In more detail, S&OP scorecards, discussed in *Chapter 3.3.5* , have features of operational and tactical dashboards. These track departmental processes and projects that are of interest to a segment of the organisation or a limited group of people. Managers and business analysts use tactical dashboards to compare performance of their areas or projects, to budget plans, forecasts, or last period's results. (Eckerson, 2006)

4 FIELD STUDY

4.1 Methodology

The main objective of this thesis is to find out how Finance can support sales and operations planning. To examine the research problem from empirical viewpoint, five manufacturing companies have been studied. Descriptive part of the research focuses on describing current S&OP practices as well as their linkages to financial forecasting and performance measurement. These findings are then compared to theories in order to develop improvement suggestions based on the identified inconsistencies. The logic of developing the improvement suggestions is depicted in *Figure 11* below:

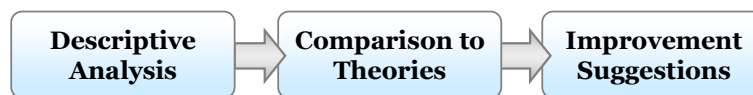


Figure 11: Logic of developing improvement suggestions

The above depicted logic will be used to separately assess each of the five manufacturing company. In more detail, each company will be analysed in their own sections in compliance with the structure above:

1. Company overview
2. Execution of the research
3. Current S&OP practices
4. Financial forecasting and performance measurement, and
5. Improvement suggestions

In order to understand the overall implications of the study, a comparative analysis of the identified practices will be presented. This analysis focuses on assessing comparative maturities of the companies in several categories regarding Finance support in S&OP. Furthermore, findings of the study will be summarized in a framework illustrating different levels of Finance maturity in S&OP.

Qualitative data regarding companies included in the research has been collected by conducting either a joint or private interview session separately for each company. This enabled fruitful discussions and distinguishing interesting findings about S&OP by bringing people from several organisational functions together to deal with the matter. The interviews were carried out by first addressing current practices of the companies and only afterwards exposing how literature suggests doing them. Furthermore, this method enabled to get direct feedback about feasibility of the theories and thus also about the possible improvement suggestions.

The interview guideline presented in *Appendix 4* was delivered to the interviewees beforehand. All interviews were recorded and conducted in Finnish and translated into English for the purpose of this research. More details about the interviews are presented separately for each company in the following chapter. In addition, information about company background has been collected from disclosed material. All companies in the research have been made anonymous due to confidential nature of the information provided. In order to support validity of the research data, each company has validated sections regarding their organisation.

4.2 Alpha Corporation

4.2.1 Company overview

Alpha Corporation is a global manufacturing company whose service network covers countries in Europe, Asia-Pacific and the Americas. Its services cover the entire lifecycle of products from development to after-market services. (Annual Report 2007, Alpha Corporation)

4.2.2 Execution of the research

The information provided about the company in the next sections is based on an interview with Alpha's Chief Financial Officer (CFO). Although the CFO stands very high in the organisation and certainly knows their planning processes in detail, it should be acknowledged that the information is based on only on person's point of view which might decrease the academic value and reliability of the study.

4.2.3 Current S&OP practice

According to the CFO Alpha has centralised its demand planning activities into sales department within each of its business areas. Since the company operates in a business-to-business environment, it is able to receive order forecast from the customers before the actual orders take place. Generally Alpha receives order information in three batches: weekly, bi-monthly and monthly information (see *Figure 12* below). Weekly received order information comprises orders for the following week whereas bi-monthly forecast covers six months into the future. Moreover, monthly forecasts comprise 12-month rolling product order forecasts.

Week	Week	Week	Week	Week	Week	Week	Week
<i>Orders for next week</i>	<i>Orders for next week</i>	<i>Orders for next week</i>	<i>Orders for next week</i>	<i>Orders for next week</i>	<i>Orders for next week</i>	<i>Orders for next week</i>	<i>Orders for next week</i>
	<i>Order forecast for the next 6 months</i>		<i>Order forecast for the next 6 months</i>		<i>Order forecast for the next 6 months</i>		<i>Order forecast for the next 6 months</i>
			<i>Order forecast for the next 12 months</i>				<i>Order forecast for the next 12 months</i>

Figure 12: Alpha Corporation’s ordinary inflow of customer order information.

Although the ordinary order forecast inflow seems to be quite extensive, Alpha’s CFO acknowledges some practical challenges with it:

The forecast tend to turn down when you look over 6 months because the customers themselves do not have the visibility.

In these situations Alpha itself develops corresponding forecasts in respective Account Teams. Moreover, forecasts received from the customer have to be often adjusted due to customer’s desire to reserve extra production capacity to secure sufficient delivery rates. Currently the forecasts are compared with actual figures and revised if corrections are needed to make. In more detail, often the forecasts are reduced by as much as 20%.

The monthly provided product level order forecast covering 12 future months is used as the basis for Alpha's S&OP process. Moreover, Alpha's business area management teams are responsible of reviewing the sales forecasts each month for individual products. After analysing the order forecasts the sales department allocates the orders to manufacturing plants where the products are later produced. Both revised and initial forecasts are communicated to the plants. After getting the sales forecast, the plants perform supply planning in form of resource planning and give feedback to business area management teams regarding their ability to meet the sales forecast allocated for its responsibility. There might be several iterative rounds between a production unit and business area management before the plan gets validated and consolidated to group level information.

After the sales department has allocated the final sales volumes to the production units, the order forecast is in line with literature uploaded in Enterprise Resource Planning (ERP) System in which Material Requirements Plan (MRP) is developed. This results in work minutes for both machines and employees at each production unit. If a capacity constraint appears the production units has two possibilities to handle the constraint: transfer resources within the unit from different business area to another or move resources between separate units. Due to employee subcontracting Alpha is able to adjust work force quite easily. Moreover, moving a production line takes approximately 2 weeks. Nevertheless, according to the CFO the product testing facilities are most often the actual constraints due to being unmovable.

The executive S&OP review is conducted monthly at each business area. The final demand and supply plans are validated in the meeting. Meeting participants come from finance, production, sales and supply chain. In more detail, business area directors attend the meetings and have the ultimate decision making power.

The overall monthly sales and operations planning process of Alpha is illustrated in *Figure 13*.

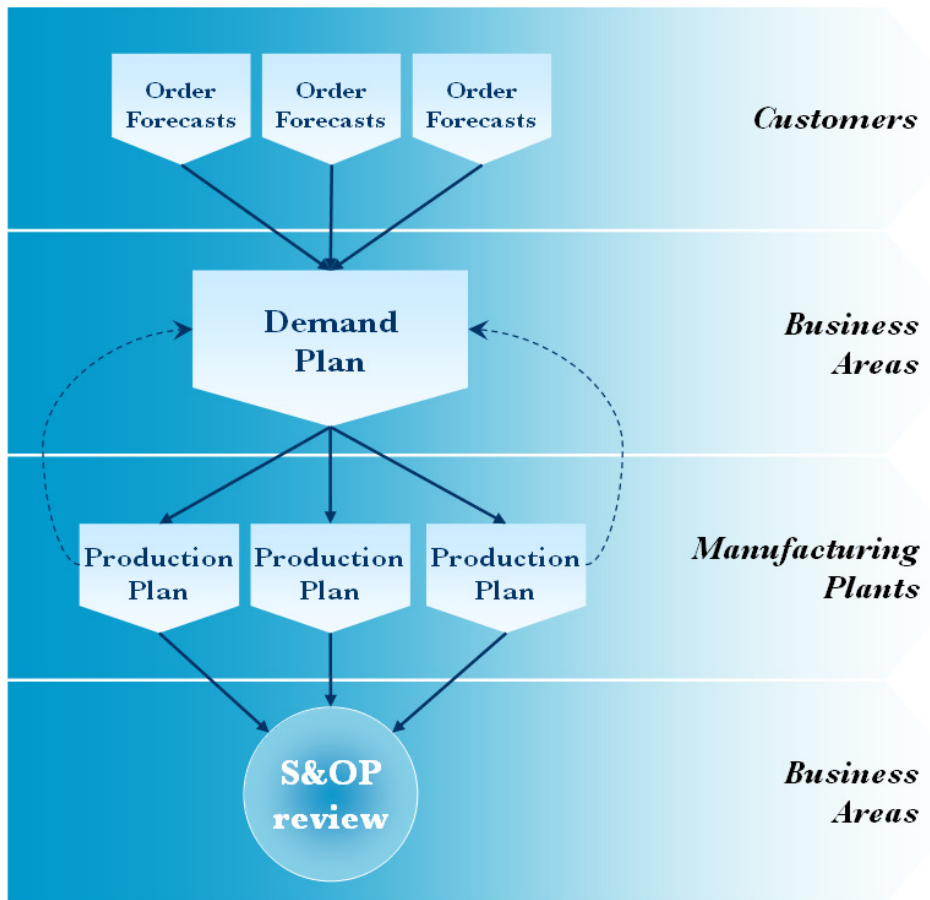


Figure 13: High-level illustration of Alpha Corporation’s S&OP process

Although Alpha’s S&OP process sounds quite coordinated, the CFO implies that it still lacks certain coherency especially at manufacturing plant level:

We are still not yet necessarily well organised as a process as this (S&OP) is more like separate events... We have the certain deadlines due to which forecasts have to be done and certain forums in which they are reviewed but maybe analysing the outcome and making conclusions is currently missing. Forecast is developed for its own sake.

The intention of Alpha is to further develop the process and increase commitment to the process also in the manufacturing plant level.

4.2.4 Financial forecasting and performance measurement

Alpha's Finance participates in the S&OP process very robustly since Controller for each business area is responsible of inviting people to the corresponding S&OP review meeting as well as facilitating and documenting the meeting. Moreover, the production units and business areas are responsible of creating financial forecast each month for the following four quarters based on S&OP information. According to the CFO profit and loss statement (P&L), balance sheet (B/S) and cash flow statement are required to be included in the forecasts, thus reflecting advanced linkage of financial forecasting and S&OP. In addition, Alpha monetises three different S&OP scenarios which represent best, worst and official plans. From S&OP point of view the CFO sees the purpose of converting S&OP into a financial view very similarly to theories:

I would see Finance as a force that integrates different (organisational) functions because sales might speak in euro amounts and production in volumes while they should anyway be able to meet somewhere.

The fact that Alpha discloses its official forecast each quarter creates a challenge regarding achieving the disclosed forecast and purpose of forecasting. Considering the disclosed forecast as a commitment within the company certainly adds transparency to shareholders as it makes the company to strive for the publicly known goals. On the other hand, it decreases the flexibility of monthly planning by setting restrictions on making large changes to plans within the respective quarter. Moreover, it seems that Alpha is currently trying to operate in favour of shareholder transparency since their purpose is to compare the new plan to the disclosed plan in the review sessions. By doing this it uses the disclosed forecast in a similar way to theories suggesting comparison with the business plan. Alpha's practice might even be more flexible due to the fact that it discloses their forecasts quarterly compared to annual budget. Nevertheless Alpha's intention, the idea has not yet flown:

At the moment the manufacturing plants develop forecasts, whole income statements, and do not necessarily compare it with the commitment given in beginning of the quarter... They forget the disclosed forecast immediately after a new forecast is done... We have tried to change that attitude but I believe it will take its time (before it starts working).

The finding that Alpha monthly prepares P&L, B/S and cash flow statement based on S&OP does not tell the absolute truth of high success regarding integration between S&OP and financial forecasting. In stead, the quality of financial reconciliation seems to be currently not as good as it should be:

One can't say that our decision making is fact-based (in S&OP), although we have great amount of facts in it. Maybe defining the cost information is not always linked with volume because when you compare P&L and the volume they do not always match due to challenges to allocate cost of over capacity.

The above comment by the CFO emphasises two important matters that have an effect on the quality of the financial forecasts. First, the forecasting practice of converting S&OP into financial terms seems currently inadequate as it is linked to volumes, although it might not be the only prescriptive driver. Moreover, the CFO wonders if time-based allocation would work better than volume for certain costs. Second, allocation of over capacity costs seems to be unfair. Currently the cost of over capacity is allocated in compliance with actual volumes for the period while the reservation made in the beginning of the period does not influence it. This result in allocating most of the idle time costs to the entity that ends up ordering the largest proportion of the volume regardless of who is responsible of its existence. Moreover, the cost of over capacity is allocated to customer profitability calculations meaning that it affects those sales employees that have their own customers. On the other hand, the cost is not allocated to products. The CFO presents that Alpha has an activity based costing (ABC) system in place to allocate the costs that have occurred.

Low quality of the monetised forecasts is probably the main reason for Alpha currently running a budgeting process that is not linked at all to monthly sales and operations planning. As they want to keep their S&OP flexible and rapid they currently seem to need a process during which they can work with the plants with comprehensiveness and focus on performance management.

Now we do the budget in order to give months for the manufacturing plants and business areas to go through the X amount of iterative rounds to develop the cost base for the forecast. If profitability is not better after that we do another round.

In other words, the budgeting process is currently needed since Alpha is not able to control the cost base of individual manufacturing units in a rapid monthly sales and operations plan. It is

however self-evident that there are parallel tasks in Alpha's budgeting process and sales and operations planning as was also presented in the theoretical part of the thesis. Therefore, the CFO sees it as a future possibility to integrate budgeting and S&OP processes:

If our monthly S&OP process would function effectively we would not even need the budget in my opinion ... I would see no reason why we should do this extra budget in which we have now reserved even two months if we could run the monthly rolling forecasting process properly ... And then we forget the budget after the first quarter.

It should be noted that controlling the cost base and financial plans is not the only way of driving performance. On contrary, performance can be driven with an effective use of performance measures. Currently, Alpha has a separate management body for balanced scorecard reviews which is in line with S&OP literature (e.g. Dougherty & Gray, 2006):

We don't have operational measures in S&OP meetings but in monthly reports or in quarterly BSC-reviews for manufacturing plants.

Due to the importance of the budget it can be argued that the BSC is not currently used effectively to drive the business. One part of the BSC is forecast accuracy. Forecast accuracy is measured as forecasted operating profit versus actual operating profit. Although they do not report forecast accuracy in S&OP, they include the previous forecast as a comparison for the updated plan.

4.2.5 Improvement suggestions

In overall, Alpha's S&OP practice seems to incorporate the main aspects that have been presented in S&OP literature, thus also including financial reconciliation of the plans. However, there are a few pain points that should be taken a closer look at in order to further develop its S&OP process.

First, Alpha's S&OP process lacks coherency as its phases are currently distinct of each other. In order to develop the process, Alpha should consider establishing and strengthening S&OP process ownership and executive sponsorship as discussed in *Chapter 3.1*. For instance, extending Finance's role from pure facilitation of the S&OP review meeting to supporting it in all process

phases might improve the coherency of the process as it would operate as the central-body or of the process.

Second, Alpha's current S&OP process lacks robust analysis of the results as well as making conclusions based on the plans. One reason that the CFO presented for this is that they lack reliable information in their S&OP review sessions:

If we had hard facts in S&OP meetings it would probably help driving performance better than currently.

One way of bringing supportive information to S&OP meetings and getting a better buy-in to the forecasts might be to start highlighting their importance through systematically reviewing the plans against actuals and the business plan in addition to the disclosed forecast. Moreover, S&OP literature emphasises the importance of comparing S&OP with the business plan to align plans with the company strategy. In addition, variances between S&OP and the budget should be of great interest also to Alpha's employees since their incentives are currently linked to the annual budget. It should however be acknowledged that this would require improving the quality of financial reconciliation which currently lacks reliability. As a consequence, Alpha should definitely assess their current planning model and analyse if it is reasonable to adjust it.

In fact, it appears that Alpha already has plans for improving allocation of capacity related costs of the financial forecasting model. In the future they will include capacity reservation discussions into S&OP meetings which will be the basis for the allocation of over capacity costs. This should enable fairer and foreseeable allocations since the allocations will be made based on the plans rather than actuals.

Another clear distinction between S&OP theories and Alpha's practices is the way performance measures are utilised. As has been presented the company does not currently have a specific S&OP scorecard in use. As a consequence, developing such a scorecard could help Alpha to better manage planning activities of individual plants as it would make information visible to all parties in the S&OP reviews. This view is also given support from the CFO while theories about S&OP scorecards were discussed in the interview:

It (S&OP scorecard) might help the process and that's something you could say we don't have at the moment which might also result in that correct questions are not made in the right occasions.

It appears that Alpha is actually already planning on implementing some kind of a S&OP scorecard in the future. The CFO implies that they are already planning to start using certain measures in S&OP:

After we go to the formal capacity reservation we will have in the (S&OP) meeting things like purchase order volume, delivery volume, assembly line minutes, employee minutes; which they have to compare with actuals and analyse how many minutes they need for the delivery volume based on the sales forecast.

These kinds of performance measures should help to control the quality and consistency of the plans while the separate balanced scorecard review aims at managing strategy implementation.

The fact that budgeting is not in any way currently integrated with S&OP seems odd. Although quality of the financial plans might not be high enough it should at least provide volumetric information of the plans and thus provide a start-up for budget iterations. Moreover, it should be acknowledged that theories do not necessarily suggest converting S&OP into budget without further adjustments. Moreover, using S&OP as the basis has been argued to provide a quick start for the budget preparation. For instance Dougherty & Gray (2006) argue that many companies have successfully linked S&OP with budgeting resulting in major decreases in time used to prepare the budgets. As a consequence, Alpha should assess its ability to utilise their S&OP process more thoroughly in the budget preparation.

4.3 Beta Corporation

4.3.1 Company Overview

Beta Corporation is a Finnish publicly listed company that has own and contract manufacturers around the world. Beta's products are sold through subsidiaries and external intermediaries. The company faces challenges due to extremely seasonal products. In fact, demand for Beta's products is very much tied to weather.

The company has four business units which represent different product groups in addition to the sales unit. The main business unit is responsible of more than half of total revenue. Product development is very significant generating one third of revenue in the main business unit. (Beta's web-page)

4.3.2 Execution of the research

A group interview was conducted with selected Beta's representatives on the 20th of October 2008 at Beta's HQ. People representing Beta were Vice President and Corporate Development, Information Systems (IS) Manager, BI responsible as well as S&OP responsible.

4.3.3 Current S&OP practice

As the interview took place, Beta Corporation had operated a formal S&OP process for almost a year. The monthly process has evolved since it was first initiated and had become routine by far. Sales forecast is developed bottom-up starting from sales units and at the end consolidated at the HQ where the production plans are done. Plans are developed at product level on a horizon of 6 months which is a shorter timeline than most S&OP theories suggest.

Operating in an industry that faces severe seasonality has lead in challenges to decide on the time period on which to focus in S&OP. The fact that weather has such a massive impact on its product demand has resulted in a situation where the company does not want to make binding decisions on their production much before hand. The main reason for this is the fact that Beta's product portfolio differs significantly in profitability. As a consequence, Beta will be certain to produce its better margin products if the weather is suitable with the cost of not producing the other products. This has resulted in a situation where Beta wants to keep its production plans flexible in case of better weather conditions.

The main objective of Beta's S&OP is very different to theories which emphasise balancing demand and supply sides of the business. Moreover, the S&OP responsible argues that their S&OP focuses on selecting the most profitable product combination to be produced rather than exact balancing of demand and supply sides of the business. The reason for not trying to ultimately balance demand and supply stems from seasonality of the business and the fact that Beta's cur-

rent production capacity has been lower than the demand. Furthermore, the company is currently increasing the number of production lines at least in one of their production units.

Decision-making in S&OP is not directly supported with formal calculations whereas decisions are currently based by large on gut-feeling and historic experience. Many of the employees have worked in the company for long periods and are argued to know the necessary facts to run the business without a need to separately prepare information into formal reports. One of the key information sources in making S&OP related decisions is the categorisation of products and sales areas into groups which represent profitability and preferred production order. Nevertheless, the information is not visibly available during S&OP but is depended on the employees' ability to use the knowledge in their decision making.

Our products and areas are categorised according to ABC but we just don't see the effects of their changes in numbers. Nevertheless, it goes through the organisation in a manner that every body knows which one is the first to be served and which one is the first to be produced. (S&OP responsible)

The Corporate Development (VP) further illustrates how this information is utilised in the company by saying:

They (product and customer profitability) are so internalised that we don't even remember to talk about them. When our experts talk with each other they don't have to mention these things because they know what product segment and product makes the money. (Vice President, Corporate Development)

These comments reflect large profitability differences that exist between Beta's products. Although they do not currently seem to aspire for more exact information to support decision making, they simultaneously understand the defects that arise from their current practice. Moreover, the fact that S&OP is currently run by employees who know the business pretty much by heart, makes the process very depended on individuals. Moreover, it might be very difficult for outsiders to understand the reasons for the decisions since they are not transparent and clearly reported. The IS Manager presents an example that supports this finding:

It feels like they (purchase decisions) are made much intuitively in the complex surrounding environment, kind of like on the way. It feels totally absurd. However, on

*the background there are well thought action patterns which have then recurred...
Clever decisions surely but you can not reason them.*

In addition, not having facts in S&OP makes the planning process fragile for changes in the business environment. The IS Manager supports this by saying:

It is certain that we wouldn't necessarily communicate if we found discontinuity...

There can be distinguished two main reasons for Beta's current decision making practice that may look like being based on gut feeling. First, Beta's values emphasise entrepreneurship and trusting on individuals which reflects that people trust in each other without necessarily requiring proofs in formal reports. Second, Beta has been growing very rapidly during the 21st century as it has more than doubled its disclosed revenue from fiscal year 2002. Due to its growth the company might have overgrown some of the processes that earlier were satisfactory. Moreover, the IS Manager illustrates these findings and their relation to S&OP by commenting:

Our culture is based on trusting individuals and human beings... Having the volumes we already are producing and being a bit bigger player we should address how far we want to take process formalising and communication.

4.3.4 Financial forecasting and performance measurement

Beta's Finance does not currently have a formal role in the S&OP process. As a consequence, Beta does not include financial reconciliation in their S&OP process. Although financial reconciliation is not directly included in S&OP, the Finance department monthly prepares latest estimates (LE) covering sales, profit and all performance measures:

Parallel with S&OP, Finance prepares the latest estimate (LE) at least once a month for the next quarter and for the rest of the year. Connection between these two is that LE is given by the director of the unit who also leads S&OP. Also that connection is only within his head... There is no procedure according to which we should go. (IS Manager)

The scarce connection between financial forecasting and sales and operations planning reflects inadequate process development and further increases the risk arising from dependency on individuals. Nevertheless, Beta is currently quite close to including financial reconciliation in S&OP since there currently exists an informal linkage between the two processes. The main thing that

seems to be still missing is a formal process for making the connection from S&OP to financial forecasting more formal.

We are not incredibly far from it (doing financial reconciliation in S&OP) since we prepare the LE's. We calculate LE for sales, profit and for all performance measures. Principally we do it every month. (Corporate Development, VP)

As the connection from S&OP to financial forecasting is only scarce, financial figures are not currently assessed in the S&OP review meeting. Not including a financial view in the S&OP process makes it currently very difficult to compare the operational plans with the annual budget that Beta uses as the basis for incentives. This indicates improper linkage to the company strategy due to the fact that S&OP theories emphasise comparing S&OP with the budget in order to assure strategic alignment. Nevertheless, the S&OP responsible argues that the budget still has an impact on the process, although it is not being directly presented in the S&OP meetings:

We have to at least achieve the budgeted level but we have not connected it in any way to the S&OP process but we rather do it as its own ongoing process. (S&OP responsible)

The purpose and potential benefits of bringing a financial view of the plans into the S&OP meetings is understood by all interviewees. Nevertheless, they do not see that the financial view could be used to optimise performance:

All answers can not be found behind euro amounts. Nevertheless, we are the small player and if we at the wrong time start competing in the markets of the major players we might momentarily make few extra money but then lose the war. (S&OP responsible)

There can be seen a slight contradiction between the above comment and Beta's S&OP objective which, as earlier presented, focuses on making the most appropriate product selections for the future. Although Finance is not currently represented in Beta's S&OP process, a few key players in S&OP have their backgrounds in Finance which is currently seen as sufficient representation.

Bringing Controller to the (S&OP) meeting would add certain flavour but nobody has yet wanted him there. (Corporate Development, VP)

Beta does not currently have a formal way of including performance measures in S&OP. Moreover, according to the Corporate Development they have certain strategic measures that cascade from the group to most business units. Nevertheless, he admits that they currently lack formal process for reviewing them.

4.3.5 Improvement suggestions

There are two evident improvement areas that were distinguished during the discussion with Beta. These are related to performance measurement and developing a robust linkage from operational planning to financial forecasting.

Probably the most significant inconsistency between Beta's S&OP practice and theory is that there is no formal financial reconciliation of the plans, and thus also no assessment of financial impact in the S&OP review meetings. Moreover, having no visibility to financial impact of S&OP currently endangers strategic alignment due to the fact that the plans are not easily comparable with the budget and strategic objectives. In addition, Beta's decision making in S&OP seems to be currently very non-transparent and by far based on gut-feeling at least partly because of not having financial figures to support the decisions.

Although Beta does not directly convert S&OP into financial terms or include them in the S&OP review meetings, they currently prepare financial forecasts parallel with S&OP. In more detail, there is currently no formal input from S&OP to financial forecasting, or the other way, whereas the financial forecasts are prepared based only on one individual Manager's own perception of S&OP. As a consequence, Beta should consider establishing a more rigorous connection from S&OP to financial forecasting in order to enable utilising the financial information also in S&OP. Furthermore, formalising the linkage could also improve the financial forecasting process by providing more coherent information of the operational plans. Moreover, due to these aspects and the finding that financial forecasting process is somewhat inefficient, the IS Manager agrees on the improvement opportunity:

It (preparation of latest estimates) is not a rapid process. Currently people responsible of making the LE's are changing. There we have a great opportunity... (IS Manager)

To establish a rigorous connection from S&OP to financial forecasting and to decrease the time required to prepare the LE's, Beta should consider developing a driver-based planning process such as based on ABC. This could enable fast financial reconciliation of S&OP due to the fact that S&OP ends up with volume related plans. Moreover, establishing a process that would integrate financial forecasting and S&OP might be ultimately valuable for both processes. First, establishing a rigorous process from sales and operations plans to financial forecasting could improve accuracy of financial forecasting due to being directly linked to operational plans. Second, it would provide financial view into the operational plans and enhance reviewing them in the S&OP review meeting. In addition, this would enable comparing S&OP with the budget thus providing a more visible linkage to the strategy.

It must however be noticed that currently Beta's S&OP covers only six months into the future, thus creating a challenge to the integration of financial forecasting and S&OP process. Currently financial forecasting is done to the year end which means that S&OP does not provide required information for the financial forecast during the five first months of the year. For instance in March S&OP would cover plans till the end of August whereas rest of the months should have to be forecasted separately for the purpose of financial forecasting. On the other hand, S&OP provides information over the current financial forecasting periods during the last five months reflecting possibility to stretch financial visibility over the year end if financial forecasting would be partly integrated with S&OP. As a consequence, Beta should assess the feasibility of extending their planning horizon to approximately 18 months which is often presented in S&OP literature.

Another significant inconsistency between Beta's S&OP practice and theory is utilisation of performance measures. In fact Beta's performance measurement and reporting practices currently seem not to be managed very robustly due to the fact that they seem not to have established clear strategic or S&OP scorecards which are both theoretically presented as supporting factors for S&OP. In addition to not seeing the financial effects of S&OP, the lack of formal performance measures in S&OP is probably another reason for the low transparency of decision-making, high dependency of individuals and lousy ability to observe changes.

As a consequence, Beta should assess their performance measurement practices in more detail in all levels: tactical, operational and strategic. As part of this, Beta should assess its needs for developing a specific scorecard to be used in the S&OP review meetings. Although there appeared some arguments among the interviewees about not needing additional information in S&OP due to experienced participants, theories present scorecards as one of the main key success driver of S&OP. Moreover, developing a S&OP scorecard would probably make decision making more transparent and thus also decrease one major risk that Beta faces: dependency on individuals. It could also help in observing changes in leading indicators which could significantly improve Beta's ability to respond to changes. As has been presented, Beta's decision-making is currently based much on the perception of most profitable products that is a result of historic knowledge. The Corporate Development seems to agree on at least some of the benefits of building such a scorecard:

In the meeting (S&OP review) it (performance measures) might work if our conception is distorted or if we have not for a while checked if it still is as we think it is. (Corporate Development, VP)

Moreover, he emphasises the use of performance measures in increasing transparency of decision making and supporting communication:

It (performance measures) is probably something we should use in communication although they would not be used in the (S&OP) conversations. It would add hard facts to memos. (Corporate Development, VP)

Not having formal performance measurement reporting has led to a situation in which Beta's employees prepare e.g. KPI calculations individually. This again has resulted in wide array of diverse calculation methods for figures that should represent the same matter. The BI responsible acknowledges this by emphasising some of the benefits that could be generated from development of common reports and scorecards:

By far have we not productised these kinds of critical questions and then they get calculated with different methods depending on the person doing it. In that way productising these kinds of critical measures into reports would be advantageous. Common report, common discussion topic for the decision makers. (BI responsible)

Developing a common performance reporting practice with scorecards could support adding transparency into decision-making as it could enhance focusing on the actual matter rather than the methods in which the calculation have been done. By consolidating information into reports and formal scorecards, decisions could be more easily communicated and reasoned to people who do not have the knowledge in their heads. These aspects are also illustrated by the IS manager:

Creating certain constant measures to support decision making and communicating them all the time forward and through the chain would most probably increase opportunity to clarify rationality of decision making for external stakeholders. At the moment it might seem as vague to people who don't know the principles.

4.4 Gamma Group

4.4.1 Company overview

Gamma is Finnish based manufacturing Group focusing on consumer goods. Its main markets are Finland, Baltic, Russia, Scandinavia and Russia. As a reflection of the industry in which the company operates in, it is highly depended on research and development. In fact, 40% of the company's annual sales come from new products (CFO).

4.4.2 Execution of the research

A group interview was conducted with Gamma's CFO, Business Controller and S&OP Leader on the 21st of November 2008 at the company's head office.

4.4.3 Current S&OP practice

Gamma implemented S&OP process in 2004. According to their S&OP Leader the main reason for the implementation was the fact that they had no view to the future. In this context he uses a traditional accounting metaphor:

It is very difficult to drive forward if you don't see there and everything you do is decided through figures in the rear-view mirrors. You will end up out of the road at some point of time if you continue operating like that.

According to the S&OP Leader their process is pretty much a copy from theoretic models since it comprises assessing new products, demand planning, supply planning and executive review

meeting. Their intention is to go through the process each month while covering 16 future months. Since Gamma has made fixed production schedules for a few closest months, S&OP is regarded as rather long-term planning which is fully in line with theories.

The plans are prepared separately for all divisions which have in total approximately 1200 individual products (S&OP Leader). According to the CFO they initially made the sales forecast on product family level but have thereafter moved to SKU-level. Although planning is done at SKU level, the demand review session focuses on product group and country level by comparing the plans with set targets, budget, year-on-year and three previous months (S&OP Leader). This finding is consistent with literature arguing that planning is most often done in SKU-level but then reviewed in the meetings in aggregated units (e.g. Dougherty & Gray, 2006). This comment is reinforced by the S&OP Leader:

We plan each market area and its customer groups at SKU-level.

Gamma's demand planning comprises three levels which reflect the organisational structure of the Group. Although the Group manufactures all of its products in Finland it operates through subsidiaries in foreign countries. In addition to subsidiaries, they also operate in co-operation with selected partners and distributors. As a consequence, total demand plan is a sum of all these:

We have basically three kinds of situations: direct customers in the domestic market, subsidiaries and partners / distributors. Domestic market is planned at customer group level as our Key Accounts plan sales for their own customers. For partners we have pretty much an integrated model. From certain suppliers we receive their procurement plans which are in fact partly fixed. For some suppliers our Business Managers prepare the plans themselves. Subsidiaries run their own sales planning process which are converted into a procurement plan by their Demand Manager. Everyone have the same rules: 16 months at SKU-level in Euros or in volumes. (S&OP Leader)

The sales forecasts are currently prepared based on historical sales information. Nevertheless, the company is planning to implement an analytic sales tool in the near future.

According to the S&OP Leader Gamma's demand and supply planning works currently pretty well since the supply plan is currently allocated to each production line based on the demand plan. In addition, they simultaneously assess their ability to meet the demand plans as they re-

view that sufficient production capacity is available at each individual production line. In general, one great aspect of S&OP has been regarded to enable analysing possible future capacity issues before they occur. This seems to work also at Gamma as the S&OP Leader comments:

Production capacity aspect is recognised when making production scheduling but also when assessing future investments: do we need additional capacity or can we discontinue certain production lines.

Nevertheless, the ability to make asset decisions in S&OP can be questioned due to the CFO's comment according to which the company currently has lots of capacity available. Excess capacity has also led to changes in the iterative discussions between sales and production. Since capacity is available, production currently aims at reaching the demand plan. On the other hand, the S&OP Leader defends the necessity of the process by bringing on the table a situation in which certain production lines did not have the required capacity available few years ago.

In compliance with theories, Gamma's S&OP process ends in a management review in which the whole management team is supposed to participate (S&OP Leader). In the management review Gamma's management team assesses the sales revenue most often at country level (CFO & S&OP Leader) which is not in line with S&OP theories that suggest reviewing them separately for each product family.

After having operated S&OP for four years it is easy for the S&OP Leader to comment on the benefits they have gained:

The benefits are related to adjustments in supply and seeing the future better than before. Because of that we have definitely gained concrete benefits. We have not faced surprises such as suddenly having a production line with 200% planned capacity utilisation. Another explicit benefit has been that we have been able to see development in inventories and therefore been able to take controlled action in order to steer them into a desired direction. Probably the third concrete benefit has been to enable analyse individual markets and countries. We have distinguished major issues in planning that we have been able to repair. (S&OP Leader)

In addition, Gamma's CFO mentions that assuring achievement of acceptable delivery rates is one essential outcome of S&OP. This was also dealt with in 2.2 in which service levels were discussed as part of demand and supply balancing. All in all the benefits seem to be well in line with

the ones presented in literature. Additional benefits are related to establishing a group-wide process that has enabled to assessing and developing planning activities in the whole group as well as enhancing analysis procedures. Nevertheless, the fact that they do not include financial reconciliation in the process probably limits the benefits arising from it to some extent. This is given support by the CFO:

This (S&OP process) serves well both demand and supply sides but we are still very far from integrated business planning. (CFO)

4.4.4 Financial forecasting and performance measurement

Gamma's Finance function does not currently participate in the S&OP process. Nevertheless, according to the S&OP Leader the following performance measures are reviewed at the S&OP review meeting:

- 12 month rolling delivery rates,
- inventory levels,
- days of inventories,
- SKU levels, and
- sales plan hit rate

The above described performance measures of Gamma's S&OP scorecard emphasise the importance of planning accuracy and inventory management as part of S&OP. Moreover, the measures in use are very similar to the ones presented in S&OP literature and has helped Gamma in controlling the quality of plans. What is outstanding is that Gamma's Finance has no role in managing the measures as they are currently directly reported from operational IT-systems. Furthermore, it appears that Gamma has not formalised their strategic performance measures into scorecards that could be easily utilised in performance reviews.

Although Gamma's S&OP process seems pretty well organised otherwise, it currently lacks financial view of the plans. According to the Business Controller budgeting is prepared once and financial forecasting twice in detail and monthly on an aggregated level.

The financial forecasting process has currently no formal link to S&OP whereas it is currently done merely as Finance exercise. The only connection between operational planning and financial forecasting is that they are irregularly compared with each other just due to interest of knowing how close they are (Business Controller). Nevertheless, it seems that these plans affect each other in a very little manner. As a consequence, the S&OP Leader comments on the value of current practice of financial forecasting by saying:

You could ask that why do Finance currently prepare forecasts since they have little value as they do not affect any manufacturing activity.

Inevitably the value of financial forecasting is currently very limited since it is not directly based on information regarding the latest operations plans. Moreover, the completeness and quality of the current S&OP information is not adequate for financial forecasting (CFO) and the value of the current financial forecasts to S&OP process is limited due to not being connected to operational plans. In addition, there currently exists a gap between S&OP and financial forecasting (CFO). The main reason for the gap lies behind their frequently renewing product portfolio that prohibits them from making plans for each product they will be selling in the future. This fact is further addressed and explained by the S&OP Leader:

30-40% of our product portfolio is new products. If you now look 16 months into the future our current products do not represent 100% of the products we will be selling due to the fact that there will be new products that we do not know today. This is the main reason why our sales plans are lower than the (financial) forecasts. We don't have the product embryos in a sense that you would be able to plan them, (S&OP Leader)

As a consequence, the rapidly renewing product portfolio creates a need for top-down adjustments since time required to develop new products is so slow that it does not support planning with the current 16 month planning period.

While financial forecasting is not directly linked with S&OP, the budget is prepared as a snapshot of S&OP (S&OP Leader). This was also presented in the theoretic part of the thesis as a possible accelerator of the budgeting process.

4.4.5 Improvement suggestions

Gamma's sales and operations planning process seems to be currently pretty well coordinated at high-level and also in good balance with S&OP theories. However, a major improvement area seems to be including Finance in the process more thoroughly. At the moment one of the few linkages between S&OP and Finance is the fact that the CFO participates in the executive S&OP review due to being part of the management team. Nevertheless, the process still lacks some important aspects suggested in theories.

As many other companies included in this thesis, Gamma's S&OP process does not include financial reconciliation of the plans, although theories present it as one of the main drivers for creating strategic alignment. As a result, S&OP is not currently directly comparable with financial objectives and lacks a common language that would make the plans easily understandable to the S&OP executive review meeting. In order to solve these issues Gamma should consider converting S&OP into financial terms which is very important from theoretical viewpoint.

At the moment the connection between financial forecasting and S&OP is very vague due to the fact that financial forecasting is done merely by Finance function which is not however included in the S&OP process. Furthermore, although the CFO challenges utilising their current S&OP information as the basis for financial forecasting, it is supported by the finding that S&OP information is currently used as the basis for the budget. To summarise, it could be said that currently Gamma's financial forecasting fails to support sales and operations planning whereas the S&OP process fails to provide reliable information for financial forecasting.

It should be acknowledged that converting S&OP into financial terms does not necessarily require full integration of S&OP and financial forecasting. Moreover, most S&OP literature pieces emphasise the importance of forecasting revenue, gross profit and inventory value for each product family. As a reflection, Gamma should consider starting by providing this kind of financial information of the sales and operations plans and perhaps keeping their financial forecasting as a separate process for the beginning. As literature however implies, many companies have been able to move into full integration of S&OP and financial forecasting.

In accordance with these suggestions and theories, it appears that Gamma is planning to include financial reconciliation in their S&OP process in the future. According to the Business Controller the company will in the future report at least margins as part of S&OP as suggested above. Moreover, the CFO implies about intentions to go even further in integrating S&OP with financial forecasting:

We aim to prepare full P&L and comparison. As long as we have forecasts and budgeting, which are not going to vanish soon, we have to do the comparisons and reconciliation. (CFO)

As was presented in *Chapter 3.2.2* preparing a full P&L requires planning of revenue and cost items that are not directly linked with sales and operations plans. Nevertheless, it seems that Gamma is already prepared for this due to the following comment by the CFO:

We will most probably have to add into it (margin) elements from several sources in order to get to EBIT-level.

In addition, Gamma's fast renewing product portfolio makes integration of S&OP and financial forecasting even more difficult due to the fact that it prohibits making sales and operations plan to all those products that will eventually generate revenue resulting in a gap between financial forecast and monetised S&OP. This means that part of the revenue and costs will have to be forecasted without connection to S&OP in order to prepare a definite financial view. According to the CFO they are planning to report the difference as a lump sum that would be forecasted separately.

As a reflection of theories, it can be argued that converting S&OP into financial terms would enable Gamma to better manage its strategy implementation and also offer realistic feed-back for the strategy. This would happen through presentation of sales and operations plans and strategic objectives in the same units. In addition, the CFO believes that including a financial view in S&OP would result in several people related benefits:

I believe that when we bring the financial element to the management review meeting we will certainly bring new light to process development, general interest, and willingness to act on issues and reconciliation.

In addition to integrating financial forecasting and S&OP, another area that Gamma should take a closer look at is its performance measurement practice. Although Gamma currently utilises per-

formance measures in their S&OP review meeting, they should also assess usefulness of establishing strategic scorecards as discussed in the theoretic part of the thesis.

4.5 Delta Group

4.5.1 Company overview

Delta is an international recycling Group operating through 100 service locations worldwide. It has a wide range of customers since it operates in both business-to-business and business-to-consumer markets. (Delta's web-page)

4.5.2 Execution of the research

One hour interview with Delta's CFO was conducted in the 5th of December 2008 at Delta's head quarter. The fact that only one manager representing the whole Group was interviewed decreases reliability of the findings.

4.5.3 Current S&OP practice

The fact that Delta operates in recycling industry creates some interesting aspects to its way of operating. First, in a normal business environment they are able to sell all the products they produce which means that the amount of material they are able to acquire plays the main role for their performance. Second, they cannot influence on prices of their end products since they are commodities whose price varies depending on global demand and supply. Delta's CFO puts it in one sentence:

The whole business logic depends on being able to purchase maximum amounts and process them with costs that together with the known commodity price will generate the greatest possible margin for us.

The CFO admits that they currently lack a formal process for sales and operations planning through saying:

We do not have that kind of a systematic process whereas it is maybe less formal but on the other hand pretty regular thinking however.

Although Delta does not have a formal S&OP process, the main elements of the process seem to be currently performed within the company since they do procurement and production planning in their own silos. Delta's S&OP practice is however very different from the original S&OP model since their constraint is purchasing, not demand as it usually is in manufacturing companies. As was already presented, they are generally able to sell all the products they are able to produce from the recycling materials.

In a sense Delta's S&OP practice can be seen as a reversed version of the traditional S&OP model since the planning cycle starts from procurement and supply planning instead of demand forecasting. In addition, this means that they have to analyse capacity matters through comparing the purchasing plans with available capacity to process recycling material into products. On the other hand, if they would be able to purchase all material amounts they desire, the commodity price of the end products would basically be the constraint of demand and supply balancing.

Since Delta operates through a matrix organisation there are two aspects included in their S&OP practice. First, purchase planning is conducted separately for each of Delta's market areas. In order to support operations planning, purchasing contracts are most often negotiated as fixed contracts including a certain flexible tolerance range for each quarter. Second, product lines plan and decide what products will be produced from the purchased material. It seems that either procurement or product lines do not currently have any formal review meetings in which consolidated plans would be reviewed. For instance, the CFO implies that each product lines might currently have their own procedures for the plans.

The executive S&OP review seems to currently take place during the management meetings of each market area. However, they seem to focus on a much shorter time period than S&OP literature recommends. The CFO says:

The country management meetings include discussions of the outlook for the next month: how much will be delivered and where, where does material come from and where it should be put if not all gets delivered.

The commodity price volatility makes it very difficult for Delta to plan their operations in much detail beforehand. As a result, Delta's operations planning happens much on daily level. As the

CFO presents, prevalent commodity prices have major influence on the decisions regarding which products the recycling material is ultimately processed to:

When we purchase recycling material we do not necessarily at that time know the end product that we are going to produce from it. For instance when we collect aluminium cans we might today think it reasonable to process it in our aluminium melting facility in order to make aluminium ingots, whereas the reasonability can change in only one night due to global market prices... Today we might say this but tomorrow we might have to announce that we will after all sell it as scrap due to good scrap prices resulting in running an empty melting facility maybe for a week.

Although commodity prices evidently set major challenges for detailed process planning, it does not prevent from excessive procurement planning which is currently the constraint in their business. This is also emphasised by the CFO through referring to long-term and short-term planning:

We prepare our long-term outlook to illustrate where the world is going, where recycling material will be composed, where are those needed, how and what should we do in the process. In addition, we do very short-term planning. We have to have an organisation that is able to turn quickly.

Responding to fluctuating commodity prices requires ability to make fast decisions and changes in operations schedules. Nevertheless, it seems that Delta is not currently able to adjust its organisation to changing market environment at the required speed. The CFO admits that they were amazingly slow responding to dramatically decreased prices during the summer of 2008. One reason for this might be the fact that Delta has more than doubled its sales during the last five accounting periods (AR 2007). Moreover, the CFO comments:

Now that we have over 100 units it (operations planning) does not necessarily work anymore. Currently we are slightly in a trouble and are working on some tools for it.

In addition, the CFO implies that due to fast growth they have outgrown their existing planning processes.

4.5.4 Financial forecasting and performance measurement

Finance supports Delta's S&OP practice through analysing monthly actuals and in some cases preparing margin calculations to decide on best ways of operating. Especially important role Finance seems to have in short-term production scheduling for which it prepares profitability calcu-

lations for different production scenarios. Estimating the logistics is very significant for the decision-making since it represent a major cost pool. These calculations are done weekly and are transparent for the CFO.

We have certain situations when we prepare financial calculations that represent logistics and process costs for operating like this and on the other hand for other scenarios also.

In general, Delta's financial forecasting processes are not coherent since they do not properly prepare any consolidated financial figures other than the budget. Due to the rapidly changing environment the budget does not however have much significance although it is included in Delta's reports. According to the CFO the main purpose of the budget is to support planning activities through providing cost information:

Probably the only thing we utilise from the budget is cost level of certain facilities. For instance we know that there will be a certain cost encumbrance if we transport material from point A to point B in which we process it... We utilise the budget to know e.g. the cost per ton of our aluminium melting facility.

As a consequence, the CFO has challenged existence of the budget many times and assessed preparing of rolling forecasts instead.

Delta's performance measurement seems to be currently managed at functional level since e.g. Finance report their own measures and production their own measures. As the S&OP process itself is very scarce, there are no particular S&OP scorecards that would be utilised to review the plans.

4.5.5 Improvement suggestions

Based on the discussion with Delta's CFO it is apparent that they should assess more thoroughly their overall planning practices which currently differ a lot from S&OP theories. Furthermore, the CFO admitted that that their current procedures are not adequately organised to be able to successfully support the grown business. As was already mentioned, the main elements of S&OP are currently performed in the company, whereas they are not performed in a coordinated matter.

Starting point for the S&OP process should have to be procurement planning since it is the constraint of the business and drives operations. S&OP theories suggest a planning horizon of approximately 18 month which means that Delta should consider integrating their current long-term outlook with S&OP. An important step that seems to be currently absent in Delta's procurement planning procedure is reviewing the consolidated procurement plans in a formal meeting. This would also help them to add global visibility to procurement planning which is currently conducted at market areas. Preparing and assessing procurement plans in a coordinated manner would bring forth information regarding the availability of recycling material. This would probably have at least two implications. First, it would provide more integrated information for decision making relating to capacity matters. Second, it would provide product lines more long-term view of the recycling materials that are going to be collected. This might be significant especially for materials that have not been purchased beforehand.

Another dimension in the S&OP process is production planning. As has been presented this is a very difficult task due to changing commodity prices which have an effect on the end-product choices. Delta should assess if it would be useful to prepare the forecast in more aggregated units and not focus on product level information. Moreover, knowing the purchasing plans of recycling material should enable to plan production volumes without focusing on the mix. This might also enable planning production in long-term.

Establishing a S&OP review meeting, such as suggested in literature, in which procurement and production parties could regularly meet to discuss about the future might support in aligning the plans by providing both knowledge of future recycling materials and expected commodity prices. Including new product development in this meeting would be extremely important particularly when new recycling materials are discussed. This co-operative meeting should help procurement to focus on acquiring those materials of which the whole company benefits the most.

On the other, theories suggest including financial reconciliation in the S&OP process. Therefore, Delta should consider whether financial reconciliation of the plans would add value for them. As has been presented, Delta does not currently prepare any financial forecasts regarding the whole business whereas the budget is by far considered as insignificant due to rapidly changing business

environment. Including financial reconciliation in S&OP would provide an updated financial view into the future but would require extra effort. Moreover, due to changing commodity prices to quality of the plans might remain questionable which could however be supported by preparing several scenarios. It should however be acknowledged that one of the main arguments of including financial reconciliation in S&OP is to enable comparing S&OP with the business plan and strategic objectives. As Delta's budget is currently regarded to some extent insignificant, the value of comparing it against S&OP would probably add only little value.

The fact that budget is mainly utilised in making cost calculations for different action plans reflects the fact that it is not currently used as a tool to implement strategy in a proper way. In addition, the use of performance measures as a strategic tool is also questionable due to being functional and only scarcely coordinated. To address these issues and to align its operations with theories Delta should assess Group-wide performance measurement by considering its purpose in tactical, operational and strategic use. For instance, using balanced scorecard method with creation of strategy maps might help Delta to integrate their currently functional performance measures into a model that as a whole aims at driving strategic intentions. Moreover, developing a S&OP scorecard could help the company in controlling quality of their planning activities by illustrating inconsistencies and earlier planning variances.

4.6 Epsilon company

4.6.1 Company overview

Epsilon is a company operating as part of a division in a global nutrition company. The company employs approximately 2000 employees. (Epsilon company, web-page)

4.6.2 Execution of the research

The information that will be presented about Epsilon is based on an interview with a company representative that works both as Controller and Business Development Manager. The interview was conducted on the 4th of November 2008 at IBM Finland head office.

4.6.3 Current S&OP practice

Currently Epsilon's Sales department prepares demand forecasts separately for the immediate future and for the long-term. Forecasting for the immediate future is focused on a very short time period and often called as demand controlling in literature. From S&OP point of view Epsilon's long term demand forecasting plays the role of demand planning since it focuses on monthly estimates. Moreover, Epsilon began formal long-term demand forecasting only a few years ago in order to increase more visibility to production side of the business and thus to secure achieving sufficient delivery rate levels. In other words, the purpose of long-term demand forecasting is to offer more time to react to changes from regular demand levels that earlier had to be done at very short notice.

Currently the Account Managers are responsible of preparing demand forecast separately for each of their customers. Major focus is put on planning of campaigns due to their significant impact on demand. Those products that are not included in the Account Managers' demand forecasts are estimated by the Procurement department. After all sales forecasts have been prepared they are consolidated by the Forecast Coordinator in order to understand the big picture of the forecasts. The Forecast Coordinator is Manager of the forecasting team.

The basic intention after consolidating all demand forecasts is to communicate them to production side of the business in order to adjust production plans in accordance to the latest sales plan. Nevertheless, Epsilon has distinguished a communications issue in delivering the demand forecast from sales to production:

I know how scarce it (communication from demand forecasting to production planning) is at the moment and the people who are doing it. It is not even close to top-of-the-line practice as information has not been delivered to production floor as well as it should have been which has lead to situations in which we run out of capacity or are obliged at the last minute to switch production line of a product that should be just going into production. (Business Development Manager)

According to the Business Development Manager especially challenging has been recognising the effects of campaigns and new product launches. This further emphasises the existence of a communication issue between sales and production functions because if communication would

function properly between the two parties, there would be only little reasons for campaigns and product launches to cause additional challenges in production planning. Moreover, it is self-evident that the earlier production receives information regarding e.g. campaigns the easier it is for them to adjust their production plans. The fact that there has not been a specific forum for people from sales, production and new product development to meet and discuss certainly seems to be the main driver for functional silos.

To better utilise their new ERP system and partly in response to difficulties in coordinating planning activities of individual functions, Epsilon is currently implementing a formal S&OP process. As presented in literature, their S&OP process will focus on medium-term planning and is positioned between Epsilon's strategic long term planning (LTP) and operations. The Business Development Manager expects that the new process will help them to significantly improve production control and also production efficiency through adding formality and integration to the planning activities.

As a reflection of the industry Epsilon operates in, their S&OP process will comprise certain special features. First, inventories have only a minor role for the company whereas they often are one of the main focuses in S&OP review. The reason for their scarce significance is that only certain products are produced to inventories while most of the products are directly delivered to customers. Due to strong bargaining power of the customers, communication towards them is extremely important. Second, the industry is very stable and total volume is not expected to change massively. This diminishes the importance of capacity related capital expenditure (CAPEX) discussions during S&OP whereas more focus must be put on mix issues in reflection to changing consumer perceptions. The Business Development Manager illustrates this by saying:

The manufacturing that we do is after all so simple that very rarely do you have to make new investments and make decisions based from capacity perspective – we rather look the market, consumers and the prevalent market situation.

In addition, including new product development in S&OP is extremely important for Epsilon because their products face massive cannibalisation effects. This means that new products will gain market share in consequence of decreasing sales of older products.

4.6.4 Financial forecasting and performance measurement

Epsilon does not currently perform financial forecasting in a formal way. However, they do traditional annual budgeting. Their budgeting process represents currently bottom-up budgeting since each cost center initially budget their own costs. Historic financial figures are used as the starting point for preparing new budgets. The budgeting process begins by making a sales budget that reflects different focus areas that have been set for sales in the company's three year LTP. This sales budget is then used as the basis for material plan that forms the production cost budget. Budgeting is in all phases done in monetary terms meaning that there is no common view into the volumes behind the plans. Furthermore, costs that are not linked to volumes are budgeted regardless of the cost budget.

In order to have better visibility into the future and to robustly react to changes in market environment, Epsilon is planning to abandon their current budgeting process and move into a rolling model which would be prepared three times a year over a four period horizon.

Epsilon has not yet made plans for utilising measures in their S&OP process. Moreover, they are currently planning to begin using performance measures at their tri-annual performance reviews but have not assessed their connection to their future S&OP process. The basic idea for performance measurement is to develop a scorecard that enables them to analyse their product portfolio through four different perspectives: customer, production, consumer and financial view. In more detail, measures would be used to analyse products and aside support decision making regarding their portfolio.

4.6.5 Improvement suggestions

The fact that Epsilon is currently implementing a S&OP process and simultaneously planning to improve their financial forecasting process by moving from traditional annual budgeting to periodic rolling forecasting brings about interesting interfaces and possibilities for improvements from Finance point of view. The main issue to be considered is to assess how to strengthen the connection from S&OP to financial forecasting. Moreover, from S&OP perspective financial forecasting should stem from S&OP due to the fact that it would better enable Epsilon to review

that there really exists alignment between S&OP and the LTP. At the same time it would provide financial plans a realistic basis since it would base them on the actual operational plans and not only financial information. Epsilon's sales plan is by definition comparable with the LTP due to the fact that it is prepared in monetary terms. On the other hand, production plans currently lack financial visibility and are therefore hard to compare with the LTP. This means that revenue information can be assessed whereas there is no view into the costs that provide it. Creating this visibility would require Epsilon to convert their production plans into financial terms.

It seems that Epsilon currently does not however have the ability to convert volume based production plans into financial terms. This is reflected in the fact that there is currently no direct linkage from production plans to the budget. In more detail, budget is currently prepared by focusing on financial terms without visibility into the volumes behind the plans. As Epsilon is moving into monthly production planning in consequence of their new S&OP process, they should assess their needs for including a financial view into the plans. In addition they should consider building a driver-based financial forecasting model such as ABC, due to the fact that volume based plans will already be provided in the production planning phase of S&OP. Driver-based planning could enable Epsilon to relatively easily convert S&OP into monetary terms and thus provide a financial view of S&OP for the executive review session.

According to the Business Development Manager financial reconciliation would be especially beneficial for the selection of products included in campaigns. As a reflection, preparing several S&OP scenarios and their financial views might add value for decisions regarding e.g. when campaigns are launched, which products are included in the campaigns and with what prices. Nevertheless, it should be kept in mind that S&OP should ultimately focus on medium-term planning and not get stuck on too many details.

If Epsilon decides to integrate their financial planning with S&OP they would be able to prepare a full financial outlook once a period in stead of just monetised sales and operations plans. Moreover, this means including also items that are not directly linked with S&OP such as cost of administration. This would provide reviewing total financial performance of the company in the

executive S&OP review sessions three times a year. However, this requires that rolling forecasting would have at least the same time horizon as sales and operations plans.

As has been presented Epsilon has already made plans for improving their performance measurement practices. Moreover, they should also assess the role of performance measures in S&OP as theories suggest developing a certain scorecard to be used in the S&OP review meetings. Moreover, using a S&OP scorecard aside their tri-annual strategic scorecard would be in line with theories that suggest using both kinds of scorecards.

4.7 Comparative maturity model

The previous chapters have focused on individual assessments of five manufacturing companies. In order to understand their relative positions against each other regarding Finance support in S&OP, a maturity model with four categories has been developed including rankings of the companies. The model enables also other companies to observe where they stand compared to others and provides reference for building process improvement roadmaps. The model has been build based on both empirical findings and theories, thus resulting in a framework that quite well captures the main findings of this research. Moreover, each category of the model will be described separately in the following sections. The maturity model is depicted in *Figure 14*.

	Level 1 Marginal Support	Level 2 Passive Support	Level 3 Formal Support	Level 4 Dynamic Support
Interface between S&OP and financial forecasting	No formal financial forecasting (Delta, Epsilon)	Financial forecasts are prepared without connection to S&OP (Gamma)	Financial forecasts reflect S&OP but are intuitively estimated without direct linkage to planned volumes (Beta)	Financial forecasts ascend directly from S&OP volumes, driver based planning (Alpha)
Leveraging financial information in S&OP	Financial effects of S&OP are not reviewed (Delta)	S&OP is driven by perception of product profitability (Beta)	Revenue is matched with the business plan (Epsilon, Gamma)	Comprehensive financial effects of S&OP are matched with the disclosed forecast (Alpha)
Frequency of financial forecasting	No formal financial forecasting (Delta, Epsilon)	Quarterly (Gamma)	Monthly (Beta)	Monthly for several scenarios (Alpha)
Performance measurement	Functional KPI-measurement with inconsistent calculation methods (Delta, Epsilon)	Strategic measures with informal review processes (Beta)	Balanced scorecard with quarterly reviews (Alpha)	S&OP scorecard and strategic measurement (Gamma)

Figure 14: Finance maturity in S&OP

4.7.1 Interface between S&OP and financial forecasting

As has been presented, theories emphasise the importance of converting S&OP into financial terms. In more detail, S&OP basically starts with operational plans that are often done in volumetric terms, thus creating a logical basis for estimating the financial outlook of the company. Due to this aspect it has a very close connection to financial forecasting. Nevertheless, the research found significant inconsistencies between the two processes.

Of the five companies included in the research, two were found not to have a formal financial forecasting process. As a consequence, these companies (Delta and Epsilon) are regarded as the least advanced compared to the others in this category, thus placed on level 1 on the maturity model regarding the interface between S&OP and financial forecasting. One reason for the lack of financial forecasting processes was presented by Delta's CFO who argued that they were too difficult to prepare because of continuously changing commodity prices. On the other hand, rest of the companies were identified to have very dissimilar financial forecasting practices especially when it comes to the linkage to S&OP.

The weakest interface between S&OP and financial forecasting was found at Gamma whose Finance function prepared financial forecasts basically without any connection to their monthly S&OP process. As a consequence, the S&OP leader saw only little value in their financial forecasts as they did not present the actual operational plans. Although the quality of the financial forecasts is very scarce from S&OP viewpoint, Gamma's practice is regarded more advanced than Delta and Epsilon's. Gamma and thus represents level 2 in the maturity model.

A slightly more advanced connection from S&OP to financial forecasting was found to exist at Beta. Moreover, Beta was identified to prepare its latest estimates (LE), which represents the financial forecast for the rest of the year, based on the output of S&OP. Nevertheless, this connection was revealed to be only harsh due the fact that it happens without any formal process in one Manager's head. Furthermore, the financial forecasts have no direct linkage to the sales and operations plans but are only reflecting them. At level 3, financial forecasts are thus regarded to reflect S&OP but to be intuitively estimated without direct linkage to planned volumes.

The above described financial forecasting practices had only scarce connections to S&OP and were consequently not utilised in the S&OP review meetings. Moreover, only one of the companies included in the research was found to truly include financial reconciliation as part of their S&OP process. This company, named Alpha, had integrated their financial forecasting process with S&OP and thus prepare full P&L, B/S and cash flow statement based on S&OP information. The financial forecasts were directly linked to S&OP due to the fact that they were prepared through driver based planning based on the S&OP output. Nevertheless, even this company still operated a separated budgeting process thus indicating room for improvements. Yet this company is regarded as the most advanced and at maturity level 4 when assessing the interface between S&OP and financial forecasting.

To summarise, the research has found very differing ways to prepare financial forecasts. Although from S&OP point of view the basis of financial forecasting should lie on operational plans, it appears that the connection between them is often very harsh. On the other hand, although S&OP offers valuable input from operational plans to financial forecasts, it seems that there often needs to be made great adjustments before the financial forecasts can be validated. For instance Gamma develops new products so rapidly that they are not able to include all of them in their S&OP which covers 18 months. This means that if financial forecasts would be based on S&OP there should be an additional calculation to represent the products that are not included in S&OP but are expected to be sold. All in all, it seems many companies have the will and often even plans to strengthen the linkage from sales and operations plans to financial forecasts in order to support providing one common plan for the whole company.

4.7.2 Leveraging financial information in S&OP

In addition to examining how S&OP is connected to financial forecasting, it is interesting to assess how companies utilise financial forecasts in their S&OP processes. In a sense this category reflects the quality of the financial forecasts from operational planning viewpoint. The focus can be placed on financial forecasts rather than monetised S&OP due to the fact that none of the companies in the study had separate processes for financial reconciliation of S&OP and financial forecasting in general.

Starting again from a theoretical perspective, it has been argued that converting S&OP into financial terms supports strategic alignment through making it comparable with the business plan. Nevertheless, companies included in the research were found not to utilise their financial forecasts very thoroughly in S&OP. This reflects the finding presented in the previous chapter according to which only one company had a robust linkage from S&OP to financial forecasting. Furthermore, using financial forecasts not prepared based on S&OP information to analyse the plans would be purely ignorant.

As an outcome of not doing proper financial forecasting and not having a specific S&OP process in place, Delta is considered to be the least advanced to utilise financial forecasts in S&OP. As a consequence it represents level 1 in the maturity model. Nevertheless, it should be noted that Delta's Finance function has a relatively active role in ad hoc based profitability calculations for short term production planning. This is not however part of the S&OP process and therefore not included in the maturity model.

Although Beta is ranked as high as level 3 regarding the interface between S&OP and financial forecasting, the company does not at all utilise their financial forecasts in the S&OP process. This highlights the lack of a proper linkage between the two processes as discussed earlier. Moreover, it was discovered that perception of product profitability has a major impact on S&OP due to the fact that it drives product selections which is one of Beta's main objectives for S&OP. The word perception is used in touch with product profitability because the calculations are not up to date and not made visible in the S&OP process. Nevertheless, due to the significant impact of these calculations on decisions in S&OP, Beta is regarded as level 2 regarding leveraging financial information in S&OP.

The finding that Gamma and Epsilon prepare their demand forecasts in monetary terms and review them against their strategic objectives during S&OP implies more structural analysis compared to Delta and Beta. Therefore, these companies are categorised as maturity level 3 regarding utilisation of financial reconciliation in S&OP. Although their practice enables matching revenue with the business plan, it simultaneously disregards costs of implementing the plans and also

keeps profit figures out of the sight. Their practice thus only partially complies with theories emphasising comparison of monetised S&OP and the business plan.

Alpha is evaluated as the most advanced company to utilise financial information in S&OP and thus deserves maturity level 4. Moreover, as has been presented it is the only company to base its financial plans directly on S&OP and to include P&L, B/S and cash flow statement assessments as part of S&OP in purpose of comparing them with the most frequent disclosed forecast. Although the company faces some challenges regarding quality of the financial forecasts, its procedure of utilising the information seems to be most advanced.

An interesting contradictory finding is that none of the companies had S&OP reports including only revenue, cost of sales and inventory value; although many S&OP literature pieces imply that this level of detail would provide sufficient details for S&OP. On the other hand, these theories tend to focus only on S&OP and thus disregard its use in financial forecasting. Moreover, most of the companies included in the research aspired for more hard facts such as financial figures of the plans into S&OP review meetings. To summarise, companies seem to strive for including more financial information of the plans into S&OP which they currently lack. This is however hindered by the current financial forecasting practices which are not properly utilising information from S&OP.

4.7.3 Frequency of financial forecasting

Theories suggest that financial reconciliation of the plans should be included in the S&OP process. From theoretical perspective companies should therefore perform financial reconciliation in compliance with their S&OP cycle which often recurs each month. Moreover, as none of the companies had separate processes for financial forecasting and financial reconciliation of S&OP, focus in this chapter is placed on how often financial forecasting is done. Nevertheless, it should be acknowledged that the linkage between the two processes was only scarce in many companies.

Due to the fact that Delta and Epsilon did not have formal processes for financial forecasting, they are regarded as level 1 in the maturity model regarding frequency of financial forecasting.

On the other hand, Gamma prepares detailed financial forecasting bi-annually and at aggregated level each month. As a result, Gamma is considered at level 2 in the maturity model.

Beta is considered more advanced than Gamma regarding frequency of financial forecasting due to the finding that it prepares latest estimates each month whereas Gamma prepares its detailed forecasts only bi-annually. Therefore, Beta represents maturity level 3. Nevertheless, Beta and Gamma are not far from each other regarding this category.

As in the previous categories of the maturity model, Alpha is considered to have the most advanced practices regarding the category under review. In more detail, it prepares its financial forecasts each month for three different S&OP scenarios and thus deserves maturity level 4 in the model.

In conclusion, companies perform financial forecasting in varying cycles. It seems that forecasting practices correlate with the organisation type due to the fact that the most advanced companies (Alpha and Beta) are quoted companies.

4.7.4 Performance measurement

In addition to including financial reconciliation in S&OP, theories place major emphasis on using performance measures to control and manage the S&OP process. Moreover, it has been argued that companies should utilise both strategic measures and a specific S&OP scorecard to support the process.

Delta and Epsilon are considered as maturity level 1 regarding performance measurement in S&OP due to the fact that they lack decent performance measurement practices. Although both of the companies were observed to utilise plenty of measures mainly for monitoring purposes, they lacked formal processes and unifying guidelines. In other words, these companies rather seem to focus on KPI monitoring rather than strategic scorecards. For instance, Delta's measurement was by far functional meaning that finance takes responsibility of financial figures whereas production of production related figures. As a consequence, these companies do not have ultimate abil-

ity to manage their performance measurement practices as a whole and to drive strategy in a coherent way.

In contrast, Beta was presented to manage their strategic performance measures from group level to the business units. As a result of more controlled performance measurement practices, it is considered as maturity level 2. Nevertheless, it was identified that Beta lacks coherent processes for actually utilising the performance measures as they do not have coherent processes for performance reviews.

Alpha, on the other hand, conducts quarterly reviews for its balanced scorecards. Since they seem to have a more coherent process for utilising their performance measures than Beta, it is considered level 3 in the maturity model.

The only company to have a S&OP scorecard, as suggested in theories, was Gamma. In more detail, Gamma reports delivery rates, inventory levels, days of inventories, SKU levels and sales plan accuracy to manage planning activities in S&OP. In addition, Gamma's CFO argues that they have well integrated measures and review processes across the group. As a consequence, Gamma is regarded as level 4 regarding performance measurement in the maturity model.

To conclude, many companies seem not to operate in compliance with theories that suggest utilising a S&OP scorecard to control planning activities. In more detail, only one of the companies had such a scorecard in its S&OP process. Moreover, companies included in the research were identified to have incomplete strategic performance measurement practices which also should be assessed more thoroughly. Nevertheless, based on the research and empirical feedback it seems that there is a need for performance measures in S&OP in order to bring hard facts to the review meetings.

4.7.5 Summary of company maturities

In overall the most advanced company regarding Finance support in S&OP is considered to be Alpha. Moreover, this consideration is rather strong due to the fact that it is the only company to

actively include Finance in the S&OP process. As a reflection it was evaluated as the most advanced company in three of the four maturity categories. First, it is the only company to directly prepare financial forecasts based on S&OP information. Second, as a reflection of the previous it has the best practice of utilising information provided by the financial reconciliation in S&OP. Third, it prepares the financial forecasts in three scenarios, thus supporting its risk management objectives. The only category in which it was not considered the best was performance measurement, only due to the finding that it does not have a specific S&OP scorecard in place. Nevertheless being evaluated as the most advanced in overall, it still faces much improvement potential as was discussed in *chapter 4.2.5* . The improvement suggestions given were mainly related to the quality of the financial forecasts and the use of performance measures.

The finding that other companies did not directly include Finance in their S&OP processes probably decreases the interest of comparing overall Finance maturities in the process. Nevertheless, this was analysed in the maturity model through focusing on financial forecasting and performance measurement. Based on those categories, the second advanced company is either Beta or Gamma. Moreover, Beta's financial forecasts were presented to have more robust linkage to S&OP whereas Gamma was evaluated as the best company regarding the performance measurement category.

The least advanced companies based on the analysis are Epsilon and Delta. Although either of the companies did not have a well functioning S&OP process in place, Epsilon is regarded as more advanced due to its extensive intentions to improve their processes.

To conclude, it seems that there are major differences in both S&OP practices and ways of including Finance in it. Companies included in the research were however identified to strive for enhancing their practices in both areas. In more detail, many of them are already taking action to decrease the gap between operational and financial forecasting and to increase the use of hard facts in S&OP through development of performance measures.

5 DISCUSSION AND IMPLICATIONS

5.1 Summary of the research

This thesis has focused on examining sales and operations planning process and Finance's role in it. The research problem defined as 'how Finance should support sales and operations planning process' was further defined through three research questions:

1. How can sales and operations planning be coordinated?
2. How can financial forecasting be integrated with S&OP?
3. How can performance measures be utilised in S&OP?

Five manufacturing companies were examined through a descriptive and normative research approach. Descriptive part of the research focused on describing current S&OP practices as well as their linkages to financial forecasting and performance measurement. Comparing these findings to the corresponding theories built basis for the generation of normative improvement suggestions. In addition, current practices of each company were compared against each other through development of a framework illustrating Finance maturity in S&OP. The main results of the research will be discussed in the following sections.

5.2 Conclusions of the research

The objective of **the first research question**, focusing on the coordination of sales and operations planning, was to understand the logic and objectives of S&OP before analysing Finance's role in the process. Theoretic part of the thesis answered to this question by presenting S&OP process, which has been described as a set of companywide planning and decision-making processes designed to balance the supply of products or services with the demand for them and to link day-to-day operations with business goals, operational planning, and financial planning (Smith, 2008). Moreover, it aims at coordinating monthly planning activities of different organisational functions to form basis for a common set of numbers across all departments (Dwyer, 2000), to implement a single game plan with joint responsibility (Gips in Inventory management report,

2004) and to reach consensus on a single sales plan that all functions will support (Harwell, 2006).

Based on the research it seems that S&OP can be an effective way of coordinating functional planning activities in a company and thus helps creating a common company-wide plan. Moreover, companies running S&OP process were found to have experienced very similar benefits compared to the ones presented in literature. These are related to more coherent and transparent planning activities, improved control and management of inventories as well as achieving targeted service levels. Nevertheless, it should be noted that companies included in the research were observed to coordinate sales and operations planning in diverse set of ways - some companies had implemented S&OP processes in close compliance with theories whereas others lacked knowledge even of its basics. In more detail, three of the companies were found to conduct a formal monthly S&OP process, one was currently implementing it and one had no formal process for aligning the plans. Nevertheless, the company without a formal S&OP is currently assessing its planning practices which have become inadequate due to fast growth.

The second research question addressed how financial forecasting can be integrated with S&OP. According to S&OP literature there should be a strong linkage between the two due to suggestions to include financial reconciliation as part of the process, or in other words converting S&OP into financial terms. Theories give two main reasons which were both supported by the empirical findings. First, financial view enables easy comparison of S&OP with the business plan and strategic objectives, thus making it easily understandable. Second, financial view offers companies a common language by integrating plans made in varying forms such as units, bookings and hours.

Discussion about including financial reconciliation as part of S&OP process is significantly interfaced with rolling forecasting due to the fact that they both deal with monthly or quarterly planning with a horizon of approximately 18 months. However, it should be acknowledged that S&OP provides information only about the volumetric plans, therefore ignoring discretionary costs such as arising from administration. As a consequence, most S&OP theories suggest includ-

ing merely revenue, gross profit and inventory value information in product family S&OP reports.

The conclusion is that financial forecasting can be integrated with S&OP by establishing a robust financial forecasting process that uses the operational plans as its basis. Moreover, from S&OP point of view the value and benefits of financial forecasts are released only if they are directly linked to the operational plans. Nevertheless, only one of the five companies was observed to have a robust connection from S&OP to financial forecasting. In compliance with the conclusion this was also the only company to truly utilize its financial forecasts to control S&OP activities. As has been presented one way of establishing a direct connection from S&OP to financial forecasting is to use driver based planning such as activity based budgeting (ABB).

A fascinating finding is that two companies doing financial forecasting were found not to have established a process for connecting them to the S&OP processes. Furthermore, the disconnection between operational plans and financial forecasts was observed to escalate criticism from operational side of the business on the value of financial forecasts.

These findings support Hansen & Van der Stede (2004) who found that performance for operational planning increases with the use of rolling budgets as well as Ekholm & Wallin (2000) who concluded that rolling forecasting is often implemented in order to improve operational planning. Nevertheless, it should be acknowledged that these studies ignored the practices companies used to prepare their rolling budgets and forecasts, and thus did not distinguish financial forecasting based directly on operational plans from the ones done merely by adjusting actual financial figures. As a consequence, this research has provided valuable input to the topic by taking a closer look at the financial forecasting practices.

The third research question addressed how performance measures can be utilised in S&OP. In the theoretical part of the thesis it was presented that in addition to strategic scorecards that can be used to align the organisation, there can also be a separate S&OP scorecard to support controlling planning activities in S&OP. In more detail, theories emphasise the importance of including planning accuracy and other measures impacted by the process in the S&OP scorecard.

Based on the research it appears that using scorecards to highlight key information in the S&OP review meetings is an effective way of supporting fact-based decision making. In addition, it seems that having certain measures visible in the meeting helps controlling the plans by bringing facts in to the table for discussion. Nevertheless, only one of the companies was found to use specific measures in its S&OP process. On the other hand, most of the companies stated that they had needs for increasing the amount of hard facts in S&OP in order to make the process work properly and thought that developing a S&OP scorecard would probably support these objectives.

Three of the companies were observed to have strategic measures in place to align operations with the strategy. As has been presented, these can affect S&OP by impacting action taken by individuals. Moreover, all companies were identified to have very different ways of utilizing the measures especially when it comes to the practices of reviewing them. Nevertheless, both theories and empiric findings support the view of having separate meetings for S&OP and strategic reviews. It also seems that companies can strategic and operational scorecards are complimentary and can thus be run parallel.

To conclude, literature is not necessarily totally unilateral on the role of Finance in S&OP since some emphasize its role in analysing the outcomes of sales and operations plans whereas others emphasise Finance's role also during demand and production planning phases (e.g. Wallace, 2004). Moreover, empiric part of the thesis concluded that only one of the five companies formally included Finance in their S&OP process. In this company, Finance's role was to coordinate the monthly S&OP executive review meetings and to add a financial view into the operational plans. As a more general conclusion, Finance can support S&OP through establishing a robust interface from S&OP to financial forecasting and by managing performance measurement. While this provides S&OP more information to be utilized in decision making, it also accelerates development of one truth in form of a common plan that is shared among all functions of a company.

5.3 Limitations and future research

This research has been conducted in order to better understand sales and operations planning and more specifically Finance's role in it. It should be acknowledged that although this research has focused on the interfaces between S&OP, financial forecasting and performance measurement, it

has not examined or discussed management control systems in overall. Although this study does not intend to recognise other parts of control systems and thus stands out from a major accounting research field, it should be acknowledged that individual controls still have significant research streams associated with them (Malmi & Brown, 2008). Nevertheless, it has also been presented that accounting control systems should not be viewed as control systems per se; rather they should be seen as part of a carefully designed total system of organisational control which comprises organisational environment, culture, structure and core control system: planning, operations, measurement and evaluation-reward (Flamholtz, 1983). As a consequence, I find it extremely relevant to study S&OP as part of an overall control system in order to better understand the circumstances that support it. For instance, one could assess how companies use S&OP, financial forecasting, budgeting and performance measurement as a whole to manage and control activities. Moreover, this thesis focused on analysing S&OP without indentifying different levels of planning hierarchy. Future research regarding S&OP should take into account that companies place varying amounts of focus on different planning levels as some companies put much effort on strategic planning and disregard medium-term planning and vice versa. Therefore, I think it would be fascinating to study all planning activities as a whole rather than focus just on medium-term planning such as sales and operations planning.

Several limitations arising from the research method should be noted when reading the thesis. It should be acknowledged that the empiric information gathered from the companies is not totally unilateral due to varying amounts of interviewees per a company. The findings are in many cases based on information provided by only one interviewee and have not been double reviewed from other information sources. The effect of group pressure should also be acknowledged regarding the joint-interviews. Moreover, the analysis and improvement suggestions are based on the researcher's understanding of the current practices and theories meaning that they should not be taken as the absolute truth. In addition, companies included in the research represent wide array of manufacturing companies which might decrease the significance of the comparative analysis. Nevertheless, the selected companies provided an interesting research group due to their varying practices.

The research has not recognised requirements for IT-systems or any kind of software. Nevertheless, it should be acknowledged that today there exist purely S&OP focused software while also some major BI-players have acknowledged its high-value. For instance, Cognos has created a blueprint for S&OP that seeks to serve the best capabilities and features needed in the process. As a consequence, future research could also focus on the IT-related challenges of S&OP.

The research has concluded that there is a clear connection between S&OP and rolling forecasting. Current accounting research about rolling forecasting has mainly focused on studying its prevalence, reasons for adoption and use as a control system. Little attention has been put on how rolling forecasting is carried out or how it should be run. Moreover, it would be interesting to conduct a quantitative study on how companies do financial planning by making a distinction between driver based forecasting and forecasting by financial figures. Especially interesting would be to analyse what method provides most accurate results and best supports its purpose.

As was presented in the *Introduction*, academic research regarding sales and operations planning is very scarce. As a consequence, lots of additional research opportunities exist around the matter.

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APPENDIX

Appendix 1: S&OP literature summary

Author(s)	Definition of S&OP	Goal of S&OP	S&OP Process phases
Bower Patrick – 12 most common threats to sales and operations planning process, The Journal of Business Forecasting, Fall 2005, p. 4 – 14.	S&OP is an orchestrated effort to influence future business, based on cooperative, ongoing analysis of available intelligence and key metrics	Measure business performance, align operations with goals, create demand and supply plans, strike balance of supply and demand improving overall supply chain efficiency and cost effectiveness of the organization	Portfolio plan, demand plan, supply plan, reconciliation process, Senior Management Review (SMR)
Dwyer J. - Box clever with planning, Works Management, Vol. 53 No. 4, p. 30 - 32 .	S&OP provides a simple link between a company's strategic plan and its day-to-day operations and forms the basis for a common set of numbers across all departments to help drive the business: this enables management to monitor the balance between supply and demand (production and sales) and so improve control	n/a	n/a
Gips - Rejuvenate your S&OP process to reduce inventory.	S&OP is a defined business practice to implement a single game plan with joint ownership between sales and operations	Satisfy the needs of the customers, the financial and non-financial goals of the business, and ensure an achievable plan for manufacturing and the outside suppliers	n/a
Grimson J. Andrew & Pyke David H. – Sales and operations planning: an exploratory study and framework, The International Journal of Logistics Management, Vol. 18 No. 3, 2007, p. 322-346.	S&OP is a business process that links the corporate strategic plan to daily operations plans and enables companies to balance demand and supply for their products	Profit optimization through the integration of sales, operations and finance plans	Demand forecast, supply plan, operating plan, implementation, measurement

Harwell Jack - Sales & operations planning in the retail industry, The Journal of Business Forecasting, Fall 2006, p. 4 - 9.	A structure of internal collaboration to resolve the natural tensions between supply and demand, to reach consensus on a single sales plan that every department in the company will support, and to coordinate and communicate operational plans required to achieve the sales plans	n/a	Weekly meetings, executive review, C-level operations review
Mentzer John T. & Moon Mark A. – Understanding demand, Supply Chain Management Review, May/June 2004, p. 38 – 45.	n/a	Meet financial goals by iterating supply and demand	Demand meeting, supply meeting, partnership meeting, final executive review session
Muzumdar Maha & Fontanella John - The secrets to S&OP success, Supply Chain Management Review, April 2006, p. 34 - 41.	S&OP is the set of business processes and technologies that enable an enterprise to respond effectively to demand and supply variability with insight into the optimal market deployment and most profitable supply chain mix.	n/a	n/a
Olhager Jan, Rudberg Martin & Wikner Joakim – Long-term capacity management: Linking the perspectives from manufacturing strategy and sales and operations planning, International Journal Production Economics, 2001, Vol. 69, p. 215 – 225.	S&OP is the long-term planning of production levels relative to sales within the framework of a manufacturing planning and control system	To establish a production plan that economically serves the needs of the market, while supporting both the strategic and financial plans of the firm	n/a
Proud John F. – Master scheduling: A practical guide to competitive manufacturing, 3rd Edition, John Wiley & Sons, 2007.	S&OP is an ongoing process, characterised by a monthly review and continually adjusted to match company plans in light of fluctuating customer demand and the company's available resources	n/a	Demand planning, Supply planning, Financial planning, S&OP meeting

Sheldon Donald H. – World class sales and operations planning: A guide to successful implementation and robust execution, J. Ross Publishing, 2006.	S&OP is a monthly planning cycle where plans for both customer expectations and internal operations are reviewed for accuracy, process accountability, lessons learned, and future risk management	n/a	n/a
Smith Mark - Sales an operations planning: Making BPM work, Business Performance Management, March 2008, p. 4 - 10.	S&OP is a set of companywide planning and decision-making processes designed to balance the supply of products (or services) with the demand for them and to link day-to-day operations with business goals, operational planning, and financial planning	To enable senior management to reach consensus on a single operating plan that allocates critical resources optimally so that the company can hit its performance targets	n/a
Ventana Research - Best practices for operational effectiveness: Sales and operations planning, Webinar Sales and operations planning spotlight 2008, March 15 2008.	S&OP is a set of planning and decision-making processes that not only balance product supply and demand but also link day-to-day operations with business goals, operational planning and financial planning.	To enable decision-makers to reach consensus on a single operating plan that allocates critical resources purposefully to reach corporate performance targets	Product review, Market & Account review, Demand consensus, Supply review, Shipment Commits, Financial review, Executive S&OP
Whisenant Chris - The politics of forecasting in sales and operations planning, The Journal of Business Forecasting, Summer 2006, p. 17 - 19.	n/a	Continuously balance demand, supply, distribution, and financial plans to achieve corporate objectives.	n/a
Vollman Thomas E., Berry William Lee, Whybark David Clay, Jacobs F. Robert - Manufacturing planning and control systems for supply chain management: The definitive guide for professionals, McGraw-Hill, 2005, 5 th Edition.	The sales and operations plan links strategic goals to production and coordinates the various planning efforts in a business, including marketing planning, financial planning, operations planning, human resources planning, etc.	To produce complete and integrated plans, budgets, objectives, and goals that are used by managers to make decisions and provide the basis for evaluating performance	Sales forecast, Demand planning, Supply planning, Pre-S&OP meeting, Executive S&OP meeting

Appendix 2: Management co control system package (Malmi & Brown, 2008)

Cultural Controls						
Clans		Values			Symbols	
Planning		Cybernetic Controls				Reward and Compensation
Long range planning	Action planning	Budgets	Financial Measurement Systems	Non Financial Measurement Systems	Hybrid Measurement Systems	
Administrative Controls						
Governance Structure		Organisation Structure			Policies and Procedures	

Appendix 3: Balanced Scorecard Approach for Sales and Operations Planning Measurements (Adapted from Palmatier & Crum, 2003)

Sales and Operations Planning	Financials
Was everyone prepared?	EBIT (\$)
Were the right people present?	Sales revenue to plan (\$)
Was the information at the right level of detail?	Margin % to plan
Were the needed decisions made?	Operating expenses to budget (\$)
Did we make efficient use of our time?	Cost drivers

Supply	Demand
Manufacturing revenue to plan	Forecast vs. actual by subfamily (units and %)
Inventory value (\$) and turns	Forecast vs. actual by top 30 sku mix
Supplier quality performance	Inventory performance by customer group
Initial test yields (\$)	On-time customer service performance (%)
Cycle times (days)	Bookings activity
Inventory record accuracy (%)	Past due customer orders
Production plan vs. actual (%)	
Master schedule performance (%)	
Master schedule stability (weekly)	

Markets	Products
Total market forecast accuracy	New product introduction on-time performance (%)
Market #1 market share	Cycle time to first customer prototype
Market #2 market share	Cycle time to safety approval
Competitive portfolio positioning	Average cycle time
	Project development costs
	Development resource load to capacity ratio

Appendix 4: Interview guideline

Theme questions regarding S&OP process:

- How do you currently operate demand planning?
- How about supply/operations planning?
- How do you integrate demand and supply planning?
- How do you run S&OP?
- What are your challenges?
- How do you react to disruptions in plans?

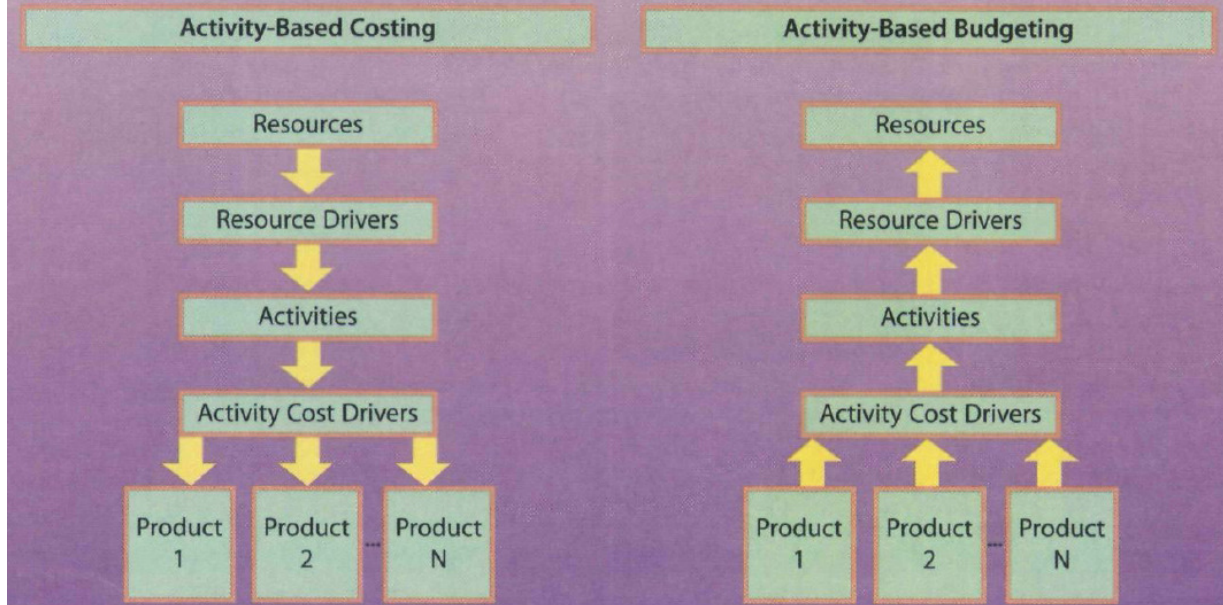
Theme questions regarding Finance in S&OP:

- Do you include Finance in S&OP?
- Do you perform financial reconciliation in S&OP?
- How do you review the S&OP plans? Do you include actuals?
- Do you utilize performance management in S&OP?
- Do you link operational goals and incentives to S&OP?

Appendix 5: Activity-based budgeting is ABC reversed (Cooper & Kaplan, 1992)

ACTIVITY-BASED BUDGETING IS ABC REVERSED

Activity-based costing traces costs from resources (people, machines) to activities and then from activities to specific products and services. Activity-based budgeting moves in the opposite direction—it traces costs from products to activities and then from activities to resources.



Appendix 6: Monetized sales and operations plan (Dougherty & Gray, 2006)

Family: All Families Average Selling Price: \$ 1,960
 Description: All Widgets Standard Product Cost \$ 1,140

ALL FIGURES IN US DOLLARS x 1000

	JAN - JUL TOTAL			History			Current		Current Year		Next Year	
	JAN	JUL	TOTAL	AUG	SEP	OCT	NOV	DEC	Expected Results	JAN	FEB	
Business Plan (Budgeted Sales Dollars)												
Budgeted Sales Plan	\$	373,576		53,900	46,256	36,652	55,076	44,688	610,148	41,160	43,904	
Current Sales Plan	\$	386,904		55,272	46,648	36,848	56,056	45,472	627,200	47,040	48,608	
Difference	\$	13,328		1,372	392	196	980	784	17,052	5,880	4,704	
Cum Difference	\$	13,328		14,700	15,092	15,288	16,268	17,052	17,052	5,880	10,584	
Sales (Sales Dollars)												
Last Sales Plan	\$	383,740		54,880	47,040	37,240	54,300	43,200	620,400	45,500	47,000	
Current Sales Plan	\$	386,904		55,272	46,648	36,848	56,056	45,472	627,200	47,040	48,608	
Difference	\$	3,164		392	(392)	(392)	1,756	2,272	6,800	1,540	1,608	
Cum Difference	\$	3,164		3,556	3,164	2,772	4,528	6,800	6,800	1,540	3,148	
Supply (Cost Dollars)												
Budgeted Production	\$	205,884		31,350	26,904	21,318	32,034	25,992	343,482	23,940	25,536	
Current Production Plan	\$	211,356		31,920	29,868	21,432	31,920	26,904	353,400	25,080	28,272	
Difference	\$	5,472		570	2,964	114	(114)	912	9,918	1,140	2,736	
Cum Difference	\$	5,472		6,042	9,006	9,120	9,006	9,918	9,918	1,140	3,876	
Finished Goods Inventory (Cost Dollars)												
Budget	\$	30,096		30,096	30,096	30,096	30,096	30,096	30,096	29,640	27,360	
Plan	\$	27,360		27,132	29,868	29,868	29,184	29,640	29,640	27,360	27,360	
Difference	\$	(2,736)		(2,964)	(228)	(228)	(912)	(456)	(456)	(2,280)	-	

Appendix 7: Monetized sales and operations plan (Wallace, 2004)

Figure 14-2 DOLLARIZED SALES & OPERATIONS PLAN — OCTOBER 2004																	
FAMILY: SMALL CONSUMER WIDGETS (MAKE TO STOCK)										UNIT OF MEASURE: \$000							
TARGET CUSTOMER SERVICE: 98%										TARGET FINISHED INV:		10 DAYS ON HAND					
AVERAGE SELLING PRICE: \$10.00										UNIT COST OF GOODS SOLD: \$5.00							
SALES (SALES \$)	H I S T O R Y											3rd 3 MOS	4th 3 MOS	12 MO TOTAL	MOS 13-18	FISCAL YR LATEST CALL	BUS PLAN
	A-M-J	J	A	S	O	N	D	J	F	M							
NEW FORECAST	\$5400	\$2000	\$2000	\$2000	\$2100	\$2100	\$2200	\$2200	\$2200	\$2200	\$2200	\$6900	\$6900	\$26,800	\$14,400	\$25,590	\$23,000
ACTUAL SALES	6150	2200	1950	2270													
DIFF: MONTH		220	-50	270													
CUM	750	970	920	1190													
OPERATIONS (COST)																	
NEW PLAN	\$2850	\$1000	\$1000	\$1000	\$1050	\$1050	\$1100	\$1100	\$1115	\$1115	\$3450	\$3450	\$13650	\$7200			
ACTUAL	2610	1000	1030	990													
DIFF: MONTH			0	30	-10												
CUM	-240	-240	-210	-220													
FINISHED GOODS INVENTORY (COST)																	
PLAN	\$450	\$500	\$500	\$500	\$300	\$350	\$400	\$450	\$500	\$550	\$575	\$575					
ACTUAL		78	89	60													
DAYS ON HAND		8	9	6	6	6	7	8	9	10	10	9					
CUSTOMER SERVICE		94%	96%	89%													
DEMAND ISSUES AND ASSUMPTIONS										SUPPLY ISSUES							
1. POSSIBLE ACQUISITION OF BIG MART BUSINESS NOT INCLUDED IN THIS FORECAST										1. NEW EQUIPMENT AT MIDDLETOWN PLANT TO BE INSTALLED THIS MONTH							