

Supply Chain Planning: Processes of a sports retail company

by
Lee-Anne Terblanche

*Thesis presented in fulfilment of the requirements for the degree of
Masters in Logistics Management in the Faculty of Logistics at
Stellenbosch University*



Supervisor: Prof. J.J. Louw

March 2015

Declaration

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent where explicitly stated otherwise), that reproduction and publication thereof by Stellenbosch University will not infringe any third party's rights and that I have not previously in its entirety or in part submitted it in order to obtain any other qualification.

Signature:

L. Terblanche

Date:

Copyright © 2015 Stellenbosch University
All rights reserved

Abstract

There are numerous supply chain planning processes and activities that need to take place to ensure efficiency and effectiveness in a company. For the case study retailer, these planning processes and activities contribute to the end goals and objectives of the company. In order to reach these goals and objectives, the importance and contribution of each of the planning processes and activities must be determined. Supply chain planning can provide a company with a competitive advantage, but it can also lead to catastrophic events when it is not fully utilised or poorly executed.

A case study was done on a South African sports retailer to determine to what extent the different supply chain planning processes and activities contribute to the end goals and objectives of this retailer and how these goals and objectives are tracked within the company. The implementation of planning processes and -activities were also investigated and what the consequences may be when the planning processes and activities are poorly executed. Goals and objectives which were given to the retailer's planners were investigated and thoroughly studied. Some of these goals included achieving effective stock policies, managing gross sales margins for products and accurate forecasting. A hybrid research method was used to gather both qualitative and quantitative data.

Interviews were conducted with planners in the company to explore their current planning methods as well as to highlight the shortcomings thereof. A job satisfaction questionnaire determined the motivators and hygiene factors (where hygiene factors refer to factors such as the employee's relationships with their supervisor, salaries and working conditions) of the employees in the company. A low level of motivators and hygiene factors may contribute to employee's responses at the workplace: exit, voice, loyalty and neglect.

The importance of supply chain planning in the sports retail industry and the shortcomings this retailer has on supply chain planning methods were determined and the crucial role planning plays in this retailer was effectively determined and comprehended. Areas for improvement include, realistic budgeting and planning, enhanced forecasting methods and investing in employee training. Results also show that the retailer is managing effective levels of planning to reach the goals and objectives of the company. However, there are key areas for improvement where focus should be placed upon.

Keywords: Supply chain planning, planning processes, planning activities

Opsomming

Daar is talle beplanningsprosesse en beplanningsaktiwiteite wat moet plaasvind om die effektiwiteit en doeltreffendheid van n maatskappy te verseker. Vir die kleinhandelaar in die gevallestudie dra hierdie beplanningsaktiwiteite, en -prosesse by tot die doelwitte en doelstellings van die maatskappy. Om hierdie doelwitte en doelstellings te kan bereik, moet die belangrikheid en bydrae van die beplanningsprosesse en beplanningsaktiwiteite bepaal en ten volle begryp word. Voorsieningskettingbeplanning kan aan 'n maatskappy 'n mededingende voordeel verskaf, maar kan ook lei tot katastrofiese gebeure indien die voorsieningskettingbeplanning swak uitgevoer word of nie ten volle aangewend word nie.

'n Gevallestudie is gedoen op 'n Suid-Afrikaanse kleinhandelaar in sporttoerusting om te bepaal watter tipe beplanningsprosesse en beplanningsaktiwiteite plaasvind in hierdie landsweye kleinhandelaar. Die implementering van die beplanningsprosesse en beplanningsaktiwiteite is ook ondersoek en wat die nagevolge kan wees wanneer hierdie beplanningsprosesse en beplanningsaktiwiteite swak uitgevoer word. Doelwitte en doelstellings wat aan die beplanners van die besigheid deurgegee word, is deeglik bestudeer. Sommige van hierdie doelwitte sluit in die bereiking van effektiewe voorraadbeleide, handhawing van bruto verkope marges vir produkte en akkurate vooruitskattings. 'n Hibriede navorsingsmetode is gebruik vir die insameling van kwalitatiewe en kwantitatiewe data.

Onderhoude is met die beplanners van die maatskappy gevoer om die huidige beplanningsmetodes te verken en om die tekortkomings in die beplanningsmetodes uit te wys. 'n Werkstevredenheid vraelys het die motiveerders en higiëne faktore (waar higiëne faktore verwys na werknemers se verhouding met die toesighouer, salarisse en werksomstandighede) van die werknemers bepaal. Lae vlakke van motiveerders en higiëne faktore kan lei tot die volgende reaksies: ontrekking, stem, lojaliteit en verwaarlosing.

Die kritieke belangrikheid wat beplanningsprosesse en beplanningsaktiwiteite behels vir hierdie kleinhandelaar was vasgestel, asook die tekortkominge wat hierdie kleinhandelaar met voorsieningskettingbeplanningsmetodes het. Verbeteringsareas sluit in, realistiese beplanning en 'n realistiese begroting, verbeterde vooruitskattingsmetodes en om in die werknemer se opleiding te investeer. Dit is bepaal dat hierdie kleinhandelaar handaaf effektiewe vlakke van beplanning om einddoelstellings en einddoelwitte te bereik. Daar is egter, sekere areas, waar fokus op geplaas moet word.

Sleutelwoorde: Voorsieningskettingbeplanning, beplanningsprosesse, beplanningsaktiwiteite

Acknowledgements

I would like to dedicate this thesis to the three men who made it possible. To my supervisor, Professor Louw, thank you for your endless guidance and patience- even when I phoned ten times a day. To my father, thank you so much for helping me fund- yet another- degree and finally I would like to thank my husband. You were my inspiration and without it, I would still be stuck with just an idea.

Table of Content

Declaration.....	i
Abstract.....	ii
Opsomming	iii
Acknowledgements.....	iv
Table of Content	v
List of Figures	ix
List of Tables	x
Chapter 1 Introduction.....	1
1.1 Introduction and Background.....	1
1.2 Rationale	2
1.3 Research Problem.....	3
1.4. Research questions.....	3
1.4.1 Main research question.....	3
1.4.2 Sub-questions	4
1.5 Aims and Objectives.....	5
1.6 Research design and methodology.....	6
1.6.1 Design.....	8
1.6.2 Methodology	8
1.6.2.1 Primary qualitative data.....	8
1.6.2.2 Secondary private quantitative data	9
1.6.2.3 Secondary qualitative data.....	9
1.7 Research variables.....	10
1.8 Layout and content.....	11
Chapter 2 Literature review.....	13
2.1 Supply chain planning.....	13
2.2 Retail planning: Current and future	14
2.3 Planning processes and activities.....	16
2.3.1 Sales and operations planning	16

2.3.2 Promotions and product life cycles	20
2.3.2 Demand and stock planning	22
2.3.2.1 Demand planning	22
2.3.2.2 Stock planning.....	24
2.3.3 Planning for sales: Forecasting and data patterns	28
2.3.4 Choosing which method to use for forecasting.....	29
2.3.5 Trends in data.....	31
2.3.6 Stock and stock control.....	31
2.3.6.1 The role of stock.....	33
2.3.6.2 The order cycle	35
2.3.6.3 Fundamental stock questions.....	37
2.3.6.4 Determining the size of the order.....	38
2.3.6.5 Buffer or safety stock.....	41
2.3.6.6 The bullwhip effect	42
2.3.7 Displaying data graphically	44
2.3.8 Supplier relations.....	46
2.3.10 Planners in the organisation	48
2.3.11 Deduction made from literature.....	50
Chapter 3 Data analysis and findings.....	52
3.1 Sales and Operations Planning	52
3.2 Promotions	54
3.3. Demand planning and replenishments.....	56
3.3.1 Forecasting for demand and sales	56
3.3.2 Planning meeting analysis.....	58
3.3.3 The order replenishment system	61
3.3.4 Warehouse replenishments and distributions	63
3.3.5 Supplier indications	64
3.4 Tracking reports.....	66
3.4.1 Tracking of stock and product life cycles	66

3.4.2 Margin tracking	67
3.4.3 Sales and product tracking.....	70
3.4.4 Key performance indicators.....	72
3.4.5 Graphical tracking	73
3.5 Stock planning	75
3.5.1 Planning for stock.....	75
3.5.2 Minimum displayed quantities	77
3.5.3 The apple-theory	77
3.6 Supplier relations.....	78
3.7 Planning phases.....	79
3.8 Interviews: Planners	80
3.9 Job satisfaction questionnaires.....	82
3.10 Supply chain disruptions.....	87
3.11 Current state versus future state.....	88
Chapter 4 Consolidated results and interpretations.....	92
4.1 Sales and operations planning.....	92
4.2 Promotions	92
4.3 Demand planning and replenishment	93
4.3.1 Forecasting	93
4.3.2 Planning meetings.....	94
4.3.3 The ordering system	94
4.3.4 Supplier indications and relations.....	95
4.4 Tracking reports.....	95
4.5. Stock planning.....	96
4.6 Job satisfaction questionnaires.....	96
4.7 Current state versus future state.....	97
4.8 End goals and objectives	98
Chapter 5 Final comments and areas for further research	100
5.1 Final comments	100

5.1.1 Comments on literature overview	101
5.2 Areas of further research	102
List of abbreviations	103
References	105
Appendix A	110

List of Figures

Figure 1: Types of research	7
Figure 2: Data present in empirical studies	7
Figure 3: The effect that over- and under sales predictions have on stock	11
Figure 4 Layout and content.....	12
Figure 5: PwC's four building blocks for the next retail model.....	15
Figure 6: Critical resources in a company	17
Figure 7: Planning processes at a higher level	17
Figure 8: The product life cycle phases	21
Figure 9: Types of decision-making inside an entity	34
Figure 10: The relationship between order cycle times and stock	35
Figure 11: The relationship between stock costs and cost of lost sales	36
Figure 12: The relationship between cost of lost sales to transportation costs.....	37
Figure 13: The EOQ Concept.....	40
Figure 14: The average stock investment under conditions of demand and lead time uncertainty	42
Figure 15: Bullwhip effect: Demand level	43
Figure 16: Bullwhip effect: Retailer.....	43
Figure 17: Bullwhip effect: Supplier	43
Figure 18: The Bullwhip effect caused by uncertain of unshared information	44
Figure 19: The steps in gathering data.....	45
Figure 20: Different planning phases.....	48
Figure 21: The responses of job dissatisfaction.....	49
Figure 22: Critical resources in a company	53
Figure 23: Typical forecasting of a planner.....	58
Figure 24: Across time sales value.....	60
Figure 25: Across time stock value.....	60
Figure 26: Across time order value.....	61
Figure 27: Illustration of how the PIS units are calculated in the ordering module	62

List of Tables

Table 1: Sub-questions	4
Table 2: Planning processes to be investigated	6
Table 3: Dependent and independent variables in the case study.....	10
Table 4: Consumer expectations.....	14
Table 5: Sales and operations planning benefits	16
Table 6: S&OP pitfalls	19
Table 7: Product life cycle and advertising techniques	21
Table 8: Importance of forecasting	23
Table 9: Different types of order quantity techniques	41
Table 10: Steps in data collection and data representation	44
Table 11; Three types of buyer-supplier relationships and their characteristic.....	47
Table 12: Benefits of retaining employees.....	50
Table 13: Goals and Objectives for S&OP meeting	52
Table 14: Forecasting of net sales example	56
Table 15: Forecasting of hockey sticks units example.....	57
Table 16: Main focal point for monthly planning meetings	59
Table 17: Example of import planning	63
Table 18: Qualitative factors playing a role in new product indications	65
Table 19: The effects of over- or under-forecasting	71
Table 20: Summary of KPI's.....	73
Table 21: Key performance indicators results for 6 months	73
Table 22: Summary of employee satisfaction and dissatisfaction questionnaire.....	84
Table 23: Summary of hygiene and motivators factors.....	86
Table 24: Employees' recommendations.....	86
Table 25: Current versus future state	89
Table 26: Explanation of current and future state variables	90
Table 27: Current versus future state.....	98

Chapter 1 Introduction

Chapter one will provide the background on supply chain planning and the importance it holds within a company. The rationale, aim and objectives are discussed and the research design methodology will be given as to how the goals and objectives of the case study will be achieved. The layout and design for the thesis will also be provided in this chapter.

1.1 Introduction and Background

Supply chain planning (SCP) consists of processes that ensure effective and efficient supply chain decision making. SCP provides the means to translate key supply chain strategic decisions into plans that direct the supply chain operations (that ultimately manages the flow of material, products, information and funds). Gartner (2010) divides supply chain planning into various subprocesses: demand planning, supply planning, stock planning, sales and operations planning. Well-developed supply chain planning processes are critical to achieve a competitive advantage. These subprocesses have been around for years and according to Gartner (2012), most companies are aware of SCP and have an understanding of these subprocesses.

Capgemini (2009), however, found in their recent study that even when faced with difficult market conditions, SCP is not yet being given the focus essential to navigate these challenges successfully. Capgemini's study was conducted with 120 supply chain executives participating across the world. Disappointingly, planning decisions are still suboptimal. They may not be based on the correct **information** and **processes**, or may be executed by **planners** with the wrong capabilities supported by ineffective enabling **technology**. Here the four key elements for effective and efficient supply chain planning are highlighted (Milliken, Fall 2008:12). Gartner (2010) states that when it comes to innovative companies it is no longer enough to "do" SCP, but "how" SCP is being done. Glen Margolis, CEO of Steelwedge, a business planning solutions company, believes there are three specific supply chain challenges: globalisation, information overload and managing all of this information in the company. All of these challenges have opportunities to improve how a company executes its planning (SupplyChainBrain, 2013b).

Capgemini (2009) stated that, "The purpose of planning is not to predict the future with prophetic certainty, but to ensure long-term success". However major challenges to maintain these levels of success or even to gain success do exist (Capgemini, 2009). There are the

traditional macro-economic conditions such as sustaining the overall business goals, but new challenges for companies have also come forth, changing economic environments, geopolitical challenges, variable demand from consumers and suppliers, exchange rates and fuel prices, to name only a few. Capgemini (2009) concluded that some major challenges in a supply chain planning environment are the continued pressure to reduce costs, manage volatility and variability, supply chain complexity and the lack of visibility. These challenges go hand in hand with the globalisation of suppliers (Capgemini, 2009).

The importance of supply chain planning can be seen in factors such as, competitive advantage and critical decision making functions. Some companies, however, still view supply chain planning as a back office execution process (Capgemini, 2009). Experts' views are that opportunities are still available for improvement such as, forecasting and planning for demand, stock replenishment, sales and operations planning, promotion planning and the integration of processes (Capgemini, 2009).

Due to current competitive markets in the sports retail industry in South Africa, the name of the company this study was conducted on will not be mentioned in this case study. This JSE listed retailer has various supply chain planning processes which form part of the daily, weekly and monthly activities of the company. These planning processes fall into short-, medium- and long-term planning. These planning periods are often referred to as planning fences or planning horizons, as mentioned by authors Burt, Percavage & Pinkerton (2010).

Planners in this retailer are responsible for all the planning related processes and activities that should be executed in order to achieve the desired goals and objectives of the company. The monthly and annual goals are given to the planners in operational and strategic meetings which take place twice a year. The final monthly and annual budgets for the company (and for the planners' respective departments and categories) are given to planners each year in January. Planners are responsible for updating the planning documents, tracking documents and to manage the planning processes and activities to reach the goals and objectives of the company.

1.2 Rationale

Failing to have the proper SCP methods in place can lead to disastrous effects, as referred to in "*The 11 Greatest Supply Chain Disasters*" (Supply Chain Digest, 2006). Companies such as Nike, Adidas, Toys "R" Us and Apple all failed to do proper SCP and had to face the consequences. Some consequences include 100 million dollar revenue short-falls for Nike,

under shipments of 80% for Adidas and an outsourcing fulfilment due to lack of planning for Toys “R” Us. It is thus important to determine the importance of implementing SCP and also to see the significance when doing it right or the consequences it may lead to when doing it wrong.

1.3 Research Problem

Capgemini (2009) found in their global SCP study that when companies are faced with difficult market conditions, SCP is not yet being given the focus essential to navigate these challenges successfully. Current issues like globalisation, increased market competitiveness and more demanding consumers are making it more difficult for companies to manage their supply chain planning (Capgemini 2009, Gartner 2012 & PwC Global Total Retail Survey, 2014).

Penalties for making SCP errors are becoming more costly and the room for making errors are decreasing as these costs in errors increase. Companies are facing stock-outs, overstock situations, recessions and changing consumer behaviour which currently makes retail one of the toughest places to do business in (Capgemini 2009, Gartner 2012, PwC Global Total Retail Survey, 2014 & Supply Chain Digest, 2006).

These market conditions, penalties and competitiveness also play a vital role for the retailer which the case study is based on. It must be determined how the retailer uses supply chain planning to overcome these difficulties. It must also be investigated to determine how the retailer tracks the changes that need to be made within the company.

The retailer the case study was conducted on has numerous short-term and medium-term business goals and objectives. To meet these goal and objectives, SCP processes and activities are needed. These planning processes (PPs) are important for the relevant company. The problem is how to manage, plan and guide these PPs in such a manner that the end goals and objectives of the company are reached while still trying to navigate between difficult market conditions and SCP errors.

1.4. Research questions

1.4.1 Main research question

For the case study, a main research question must be asked to determine the main purpose and theme of the study: To what extent do the different supply chain planning processes

contribute to the end goals and objectives of this retailer and how are these goals and objectives tracked within the company?

Planning processes will thus be investigated throughout the study to determine the contribution each of these processes have on the retailer. It is also of importance to track the processes to measure how these end goals and objectives contribute to the retailer’s successful performance.

1.4.2 Sub-questions

Following the main research question, which highlights the main theme and purpose for the study, sub-questions must also be asked to elaborate on the main research question. These sub-questions determine further areas of research that need to be done. These sub-questions are not limited to a specific process or activity.

Table 1: Sub-questions

Processes and activities	Sub-questions
Sales and operations planning	What types of planning processes and activities are used? What types of planning processes and activities should exist? What are the areas of improvement? What key performance indicators does the retailer use to measure performance and improvement? How do the planners contribute to the planning processes and activities? How is the gross sales margin managed and calculated for products?
Collaborative planning: Forecasting and replenishment	What are the areas of improvement? What is the stock replenishment and distribution procedure? How is forecasting done for demand and sales?
Event planning, promotions and product life cycles	What are the areas of improvement? How is promotional planning done? How is the stock controlled? For example, product life cycles and product status.

Processes and activities	Sub-questions
Demand planning and stock planning	<p>What are the areas of improvements?</p> <p>What are the stock replenishment and distribution procedures?</p> <p>How is the stock controlled? For example, product life cycles and product status</p> <p>How is forecasting done for demand and sales?</p> <p>Does employee job satisfaction play a role in job execution?</p> <p>How is forecasting done for demand and sales?</p> <p>How is the gross sales margin managed and calculated for products?</p>
Distribution planning (unconstrained, distribution requirements planning and deployment)	<p>What are the areas of improvement?</p> <p>How do the planners contribute to the planning processes and activities?</p>

1.5 Aims and Objectives

The aim of the study will be to first determine the various SCP processes that take place in this nationwide sports retailer (from a planners perspective) to ensure that the desired short- and medium-term goals and objectives of the company and stakeholders are met. Some of these goals and objectives are relative to stock policies and control, gross sales margins and forecasting. Secondly, the aim will also be to determine why these processes are important and what impacts each of the processes has on the retailer and on one another.

The planning processes (PP) will be individually evaluated on how each PP contributes to the short- and medium-term goals of the company. During a pre-study interview with the sport retailer's planning executive, it was established that important short- and medium term goals for this sports retailer include the following:

- Achieving and monitoring effective stock policies
- Stock control, stock replenishment and distribution
- Managing the gross sales margin for products
- Accurate demand, sales and promotional forecasting
- Monitoring and controlling product statuses, for example product life cycles

The main focus of the case study will be on the goals set by the planning executive for the planners and these goals include investigating the SCP processes. The planning processes (Table 2) will be measured using specific variables in Section 1.7.

Table 2: Planning processes to be investigated

Planning processes to be investigated
Sales and operations planning
Collaborative planning: Forecasting and replenishment
Event planning, promotions and product life cycles
Demand planning and stock planning
Distribution planning (unconstrained, distribution requirements planning and deployment)

1.6 Research design and methodology

Different types of research designs and methodologies exist which can be used to answer a research problem. A study can be empirical or non-empirical. Empirical studies comprise of primary data such as surveys, experiments or ethnographic studies whereas non-empirical studies include philosophical analyses, theory building or conceptual analyses (Mouton, 2001:57). Existing data can also be analysed through empirical studies and this can include text data such as historical studies or content analysis. Numerical data can also be used which can form part of statistical modelling or secondary data analysis. Data can be primary or secondary. Primary data refer to original documents, original created works or relics and artefacts. Secondary data take primary sources and interprets and analyses the information, these include textbooks, and historic or journal articles (Princeton University, 2014).

An empirical study can be quantitatively based and can provide an in-depth description of the participant which the study is based on. This may be a community or a group of people. The design classification here can be a low control empirical study. Such an empirical study can be referred to as an ethnographic research. Another type of ethnographic research is a case study. A case study can be qualitative and aim to provide an in-depth portrayal of a small number of cases. Key research questions in a case study can be exploratory and descriptive which will help gather more in-depth information. The application of case studies can be on companies, organisations or in social work research (Mouton, 2001:148-149).

1.6.1 Design

This thesis will be based on a case study research as the benefit of a study like this is that in-depth insights into the study are made possible. With a case study it is possible to use reporting based on the research subjects and will also provide a high concept of validity. Possible limitations of a case study should also be mentioned and these include the potential bias of the researcher and the results which cannot be generalised to the wider population (Mouton, 2001:148 & McLeod, 2008a). The design classification of a case study is to use empirical hybrid data which is both text and numeric data which are of low control, refer to Figures 1 and 2 (Mouton, 2001:149).

A hybrid method was used where both qualitative and quantitative data were collected (Mouton, 2001:57,144,145). This method was chosen, because both qualitative and quantitative information play an important role in this case study. Qualitative data were gathered from interviews to obtain information on independent variables. Quantitative data were also required to measure the independent and dependent variables. Refer to Section 1.7 for variables.

Primary qualitative and secondary quantitative private data were gathered from the retailer. Secondary qualitative data were used to interpret the data gathered through a detailed analysis of what other studies, researchers and professionals have conducted. Secondary private data were collected from the retailer such as monthly reports on stockholding, margins, profits, aging stock analysis, etc. to help interpret the results of the dependent and independent variables.

During interviews conducted with the planners and planning executive, it became apparent that the planners in this retailer play a significant role in achieving goals that have been set for the company. Planners therefore played a key role in this case study while studying the methods used to achieve these goals. The case study thus focused on the role of the planner and how the planners plan for the PP and activities which need to take place to achieve set goals.

1.6.2 Methodology

1.6.2.1 Primary qualitative data

Qualitative data was gathered from interviews and questionnaires which were conducted with professionals in the retail industry. These professionals included an executive planning

manager, a senior planner and seven other planners from different departments in the company. The interviews entailed asking planners what goals they have been given, how these goals were going to be achieved, the impact of these goals on the company, how the goals affect one another and what the effects will be should the goals not be properly planned for or if the goals are not achieved. Planners were asked to elaborate on the importance of meeting the goals and objectives, which were given by management, and how the planners plan the daily and monthly activities to meet these goals. In order to see what the importance of the job satisfaction in the workplace is questionnaires focused on job satisfaction were given to employees to complete. A Likert Scale was used to measure and to ask a range of questions which includes key elements of job satisfaction (Robbins & Judge, 2010: 115).

1.6.2.2 Secondary private quantitative data

The company uses several internal reports to monitor the goals that are given to the planners. These reports include:

- Stock aging analysis
- Product status reports
- Margin reports which track the sub-departments gross sales margin, discount planning, sales versus last year, etc.
- Sales reports measured against last year's sales and are reported weekly and then monthly
- Week to date and month to date sales reports which the planners update on a daily basis
- Product promotion reports
- Weekly store reports which measures the store's performance

These reports were studied to see if desired goals and objectives were met on a monthly basis, as well as on a weekly basis. In these reports, it is possible to see the current and forward planning of the planners, current and forward sales predictions, current and forward stockholding predictions and overall planning predictions, what the budget was and what was actually achieved. Thus the reports can provide details if goals and objectives were met.

1.6.2.3 Secondary qualitative data

A detailed literature review was conducted which was supported by empirical research in the field of supply chain planning. Research was also done on what SCP activities are, the

importance of SCP, how the activities are implemented in a company and what other publications have been published on supply chain planning.

1.7 Research variables

Dependent and independent variables will be investigated which may have a direct effect on the outcome of the goals and objectives and how the planning is done in the company. The variables are summarised in Table 3. The four key elements of effective and efficient supply chain planning are highlighted (Milliken, Fall 2008:12). Figure 3 shows what the effects can be on stock levels when over- or under predicting sales during the planning processes of the retailer.

Table 3: Dependent and independent variables in the case study

Dependent variable	Independent variable
Gross sales margin	Cost price of the product Selling price of the product Negotiation skills of the buyers and planners Incorrect or correct methods being used
Overstock/Understock situations	Aggressive demand forecasting Over estimations of forecasting Incorrect products being purchased Correct price of the product Correct replenishment Information available/Accuracy of the information Technology available Planning processes Distribution planning Sales and operations planning Demand planning Stock planning Collaborative planning Managing product life cycles Incorrect or correct methods being used
Successful promotions	Accurate demand forecasting Correct prices of products Sales and operations planning Incorrect or correct methods being used

Dependent variable	Independent variable
Accuracy of planning	Accurate demand forecasting Knowledge/Competence of the planners Incorrect or correct methods being used Aggressive demand forecasting Demand forecasting bias

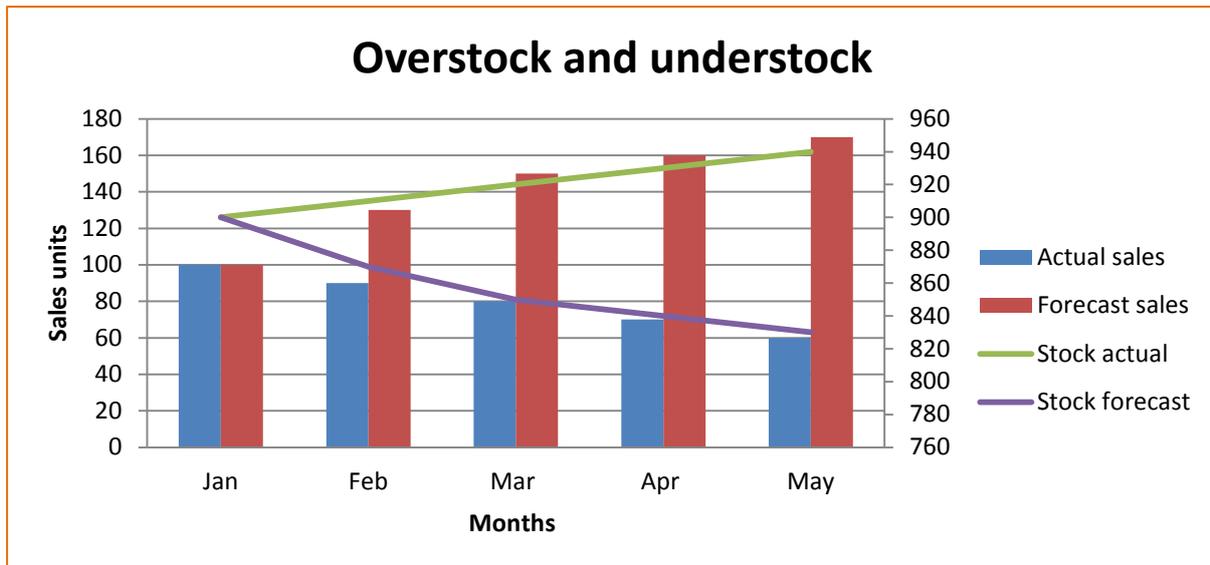


Figure 3: The effect that over- and under sales predictions have on stock (figure developed by author, data adapted from company reports)

In Figure 3 the effects of over sales and under sales predictions can be seen. If the forecasted sales realise, the stock levels will decrease. The opposite effects can be seen when the forecasted sales are too low. If forecasted sales are too low and the sales do not realise, stock levels will increase.

1.8 Layout and content

In Figure 4, the layout and content of the thesis can be seen. Each chapter is given a brief overview. Chapter 1 deals with the introduction to the thesis, the background to the case study as well as the research aims and objectives. Chapter 2 provides the reader with a literature overview where Chapter 3 uses the information gathered in Chapter 2 to compare the findings to the retailer. Chapter 4 provides conclusions and Chapter 5 provides final comments and areas for further research.

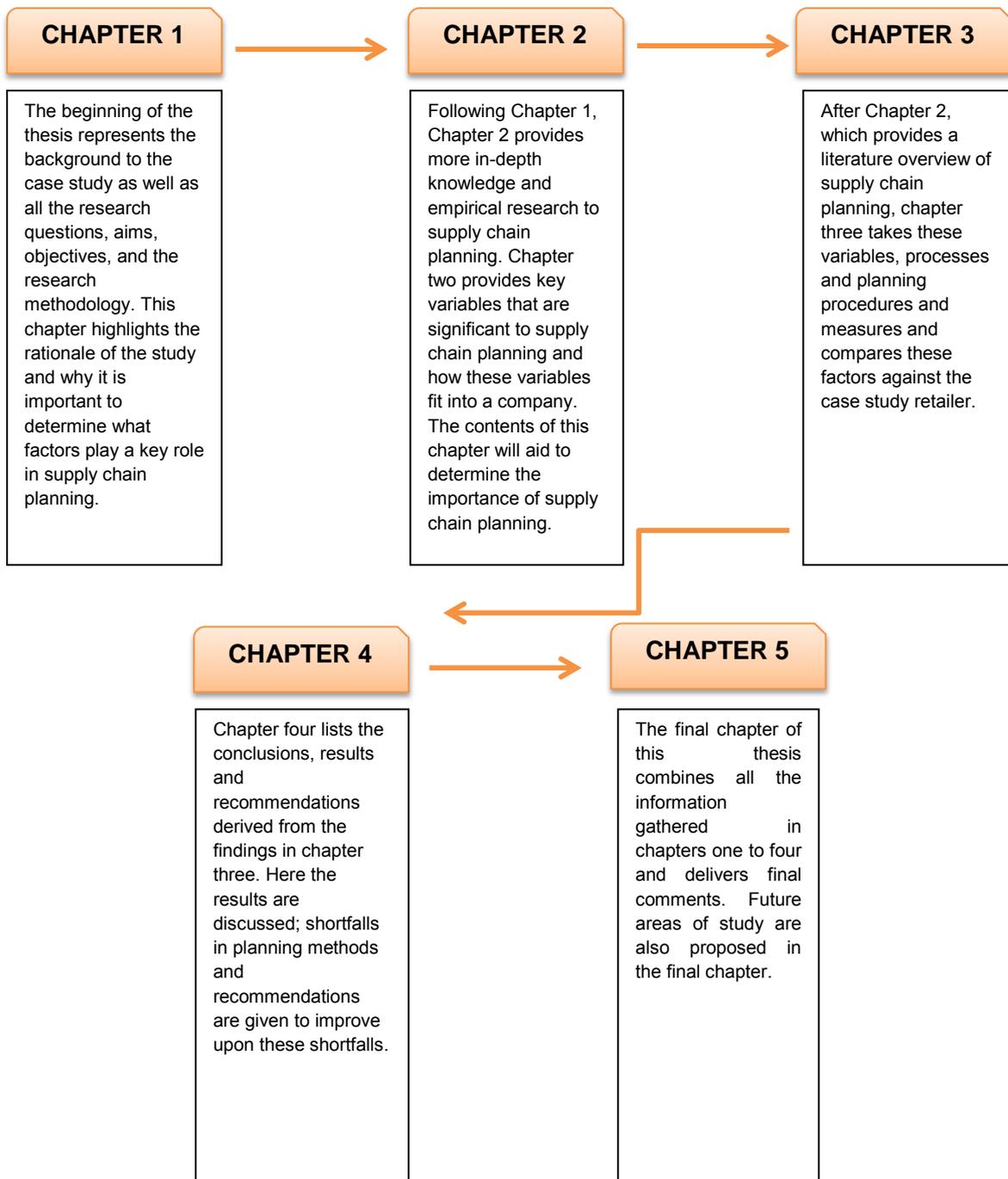


Figure 4 Layout and content

Chapter 2 Literature review

The following section provides an overview of supply chain planning, what the current trends are in retailing and breaks down all the planning activities and processes that need to take place within a retailer when focusing on the case study goals and objectives. This section will provide more insight for the reader to understand all the different dynamics and effects supply chain planning may have on a company. A detailed literature review which supports the empirical research will provide insight on supply chain planning.

2.1 Supply chain planning

Most companies view supply chain planning as a competitive advantage for their company as well as a critical decision-making function area (Capgemini, 2009). Companies in the global Capgemini study were of the opinion that there are opportunities for improvement for the following supply chain planning processes:

- Forecasting/demand planning
- Stock/replenishment planning and optimisation
- Sales and operations planning
- Production planning and detailed scheduling
- Collaborative planning with customers
- Integration across processes
- Promotions planning
- Collaborative planning with suppliers
- Network optimisation
- Demand sensing and demand shaping
- Logistics planning
- Supply planning

Gianluigi Mason, a director of supply chain planning at Barilla (an Italian food company), stated that “A successful supply chain planning organisation creates value while supporting whatever strategy the company follows.” (SupplyChainBrain, 2013a). SCP also needs to extend beyond the four walls of a company. SCP must embrace several activities at once across the company and should also include all the processes involved from suppliers, right through to the customers.

2.2 Retail planning: Current and future

There has been an increase in competitiveness in the retail industry and this has led to a greater need for customer focus and operation efficiencies. Retailers are trying to aim for a broader variety in products, increased sales and profits all at the same time while trying to lower costs (Hüber, Kuhn & Sternbeck, 2013). Retailers are losing potential sales due to the problem of getting the correct product at the right time to the right place. The gap presented between supply and demand has left retailers with stock situations such as carrying too much stock of what the customers do not want and too little stock of what the customers do want (Friend & Walker, 2001).

Penalties for the mistakes retailers are making are becoming very costly: Kmart, a very popular American retailer, had to write off 400 million dollars of excess stock. This resulted in a staggering 40% decline of net income (Friend & Walker, 2001). Another challenge retailer's face is getting the correct mix of products allocated to stores. This may vary due to the demographic profile of where the stores are located and also the floor space restrictions of the retailer (Friend & Walker, 2001).

Consumers are shifting their buying patterns to demand more value, better service and convenience. Retailers have to offer better services to meet the needs of the customers (Deloitte, 2014). Retailers need to be both efficient in modelling and efficient in decision making techniques (Hüber *et al.*, 2013). Hüber *et al.* (2013), mention that the primary objective of the retailers is to bridge the gap between the production and the point of sale and for a retailer, picking in a warehouse is as good as the production point. Product in the warehouse has to be distributed to stores for replenishment on a frequent basis (Hüber *et al.*, 2013). In a recent study on "Achieving Total Retail" by auditing giant PwC, PwC discovered eight consumer expectations retailers will have to incorporate in future planning (Table 4).

Table 4: Consumer expectations (PwC Global Total Retail Survey, 2014)

Consumers' Expectations
A compelling brand story that promises a distinctive experience
Customised offers based on totally protected, personal preferences and information
An enhanced and consistent experience across all devices (technology devices such as mobile phones and tablets)
Transparency, real time, into a retailer's stock

Consumers' Expectations
Favourite retailers are everywhere
To maximise the value of mobile shopping, both store applications and mobile sites must improve
Two-way social media engagement
"Brands" act like a retailer, and we'll treat them that way

The Total Retail report clearly shows how consumers are shifting in buying patterns and retailers need to take action on these changes. The retail business model cannot purely have small innovations and supply chain improvements cannot differentiate a retailer. New retail models need to take into account the changing needs of the consumer. PwC (2014) also provides four building blocks retailers must use for the next retail business model.

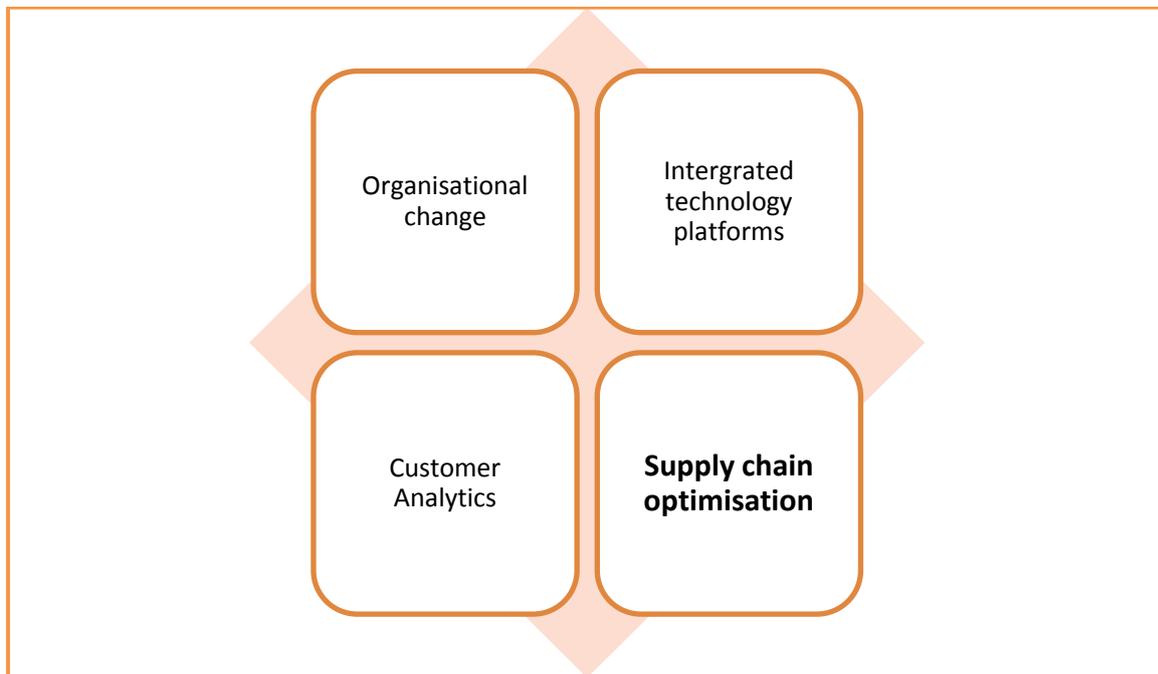


Figure 5: PwC's four building blocks for the next retail model (Pwc Global Total Retail Survey, 2014)

A retailer must be able to change the organisation to use integrated technology platforms so data can be easily shared across all channels in the supply chain and to use customer analytics tools to aid interpreting point of sale data. The supply chain must also be optimised not to focus so much on cost efficiencies, but to get the customers the products they want, when and where they want it (PwC Global Total Retail Survey, 2014).

2.3 Planning processes and activities

2.3.1 Sales and operations planning

Sales and operations planning (S&OP) is the tactical process of bringing all the plans of the company together into one aligned plan to support the business strategic goal (Milliken, Fall 2008:4). These include the company's customers, sales, marketing, development, manufacturing, sourcing and financial plans. This enables a company to gain a sustainable competitive advantage (Milliken, Fall 2008:4, Wang, Hsieh & Hsu, 2011:248). Bower (2005:4) refers to S&OP as a five step process which includes the product life cycles, demand and supply plans, reconciliation of the plans and finally, senior management review. With constant changes in supply and demand, companies struggle to keep up with correct stock levels (excess and out of stock levels) and discounting unwanted products. This uncertainty and imbalances are costing companies millions each year (Hitachi, 2007). Sales and operational planning provide the advantage to companies to gain more visibility and agility when planning for stock levels and promotional planning. Sales and operations planning benefits can be seen in Table 5.

Table 5: Sales and operations planning benefits (table adapted from Hitachi, 2007)

Sales and Operations Planning Benefits
Better visibility into the demand and supply
Better product life cycles and management processes
Improved promotional planning
More predictable revenue management
More accurate budget forecasting

S&OP views planning at a higher level, i.e. on a monthly basis with an annual review horizon. This helps companies see critical elements in advance such as overstock situations, fixed capacity constraints, regional velocity of demand and financial reserve accruals (Hitachi, 2007). Figure 7 illustrates the integrated planning processes at a higher level.

S&OP helps companies develop an operating plan which is well coordinated. The plan supports the view that the customer's demand is present in a business, the business plans, as well as the strategies. S&OP can be seen as a vehicle of communication. This vehicle puts the vision, strategy, financial and the tactical plans of a business into one unified operating plan

processes that often need to take place on a weekly basis. The processes that form part of the daily activities are production execution, purchasing and logistics execution.

S&OP can be used in the retail sector to successfully manage the constraints of limited stock budgets, floor displays and marketing funds (Harwell, 2006:4). As the markets change to customers seeking more variety and choice between products at a lower cost, the challenges retailers face have increased exponentially. Price competition has increased as customers are seeking better varieties of products for a lower price (Harwell, 2006:4). As the changes occurred in the market, retailers struggled to keep up with outdated supply chain capabilities. Constraints that retailers are familiar with include:

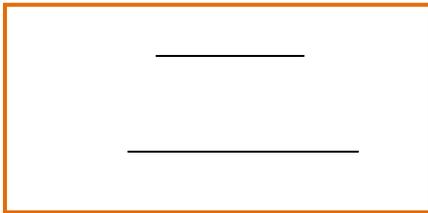
- Cash available for purchasing merchandise
- Available display space in the store
- Marketing funds
- Required profits that must be made

Consumers demand a big variety of items at lower costs while retailers still have to struggle with making a profit out of the items. The next struggle is to acquire enough floor space to display all the products. Retailers have to do assortment planning; these assortments must provide enough variety for the customers, but it must also be profitable for the retailer to keep all of the different stock keeping units, (SKU's) (Harwell, 2006:4). Sales planning is therefore a crucial aspect of the S&OP framework. Sales planning can establish the company's goals and can be seen as a tool to measure the company's success in reaching these goals (Harwell, 2006:6). When planning what stock levels should be carried, unit sales must be taken into account, but financial planning for this stock must also be done. Financial planning forms the basis of stock planning. Financial stock planning is directly related to the budget of the purchasing plan, here the term "open to buy" is typically used (Harwell, 2006:6). The term "open to buy" refers to what quantities of products are available to buy and at what time it needs to be bought.

The sales and stock planning reconciles to the financial planning and the unit sales plan. The plans of the company should therefore be reconciled with each other: the stock plan, sales unit plan and financial plan. If the reconciliation does not happen, the company runs the risk of not reaching their goals (Harwell, 2006).

Harwell (2006:9) recommends using metrics and key performance indicators (KPIs) to measure the company's goals. The main constraints Harwell emphasises should be measured

are the display space and the stock levels. The constraints must be measured in gross profit return on space (GPROS) and on gross profit return on Stock (GPROI). By measuring these constraints, profits can be optimised.



Equation 2.1: GPROS & GPROI

Where units of measurement are: m² and profit and inventory in Rand.

Top level support is critical to S&OP (Harwell, 2006:9 & Milliken 2008:4). Senior management should express what KPIs are important to the company and these KPIs should be designed to highlight and measure the importance of everyone in the company (Harwell, 2006:9). Bower (2005:6) identifies twelve S&OP pitfalls that are most common in a company. These pitfalls are not limited and can occur in a variety of company sizes and industries. Table 6 are some of the pitfalls which companies make. These include S&OP meetings not being held regularly or managers focussing on past sales instead of focussing on how to improve past sales or past mistakes.

Table 6: S&OP pitfalls (table adapted from Bowers, 2005:6)

S&OP Pitfalls
There is a disconnect between S&OP and corporate strategy
Indecision of senior management
The single-number forecast is not reality based
We meet every month...more or less
The process focuses on the balance of the year
The S&OP leader also owns supply or demand planning
Leaders are "obsessed" with last month's sales
S&OP ignores product life cycle management
S&OP ignores or excludes extrinsic (external) business trends
Failure to measure and monitor progress
No understanding about proper meeting procedures

S&OP Pitfalls

Office "politics" undermines progress

Bower (2005:6) states that corporate strategies are developed by strategists, but strategists fail to develop KPIs to measure these strategies. Often, corporate strategies are developed, but are only revisited again in the next planning cycle. By using S&OP to monitor and improve corporate strategies, an overall alignment of the company can take place together with execution of the overall corporate strategy (Bower, 2005:6).

S&OP meetings should begin with follow-ups from the previous meetings so each meeting will have meaning and set out goals to reach. Decisions that are hard to make should be made quickly and should be implemented as such. All parties should be involved in the decision making process and parties must be willing to give their contribution to the decisions (Bower, 2005:6). It is important not to lose sight of what was committed to and this usually requires a cultural change that must be driven from top management (Bower, 2005:14).

2.3.2 Promotions and product life cycles

Promotions fit into the four P's of the marketing mix: price, product, promotion and place (Langley, Coyle, Gibson, Novack & Bardi, 2009:48). Promotions can be part of planning to enhance or stimulate sales for a particular or a wide range of products. Planners and buyers need to make sure that there is sufficient stock available when planning a promotion (Langley *et al.*, 2009:50). Marketing strategies can be either classified as a push or pull system. A push system refers to products being pushed through the distribution system, or alternatively, being pulled by the customers (Langley *et al.*, 2009:50). Product life cycles also need to be kept under vigilance as shorter product life cycles are more common as products can be easily duplicated (Langley *et al.*, 2009:8). The product life cycle provides the means to track the products through the different phases the products go through in the market (Lamb, Hair, McDaniel, Boshoff & Terblanche, 2008:244). There are four stages in the product life cycle, the introductory stage, growth stage, maturity stage and the decline stage (Figure 8).

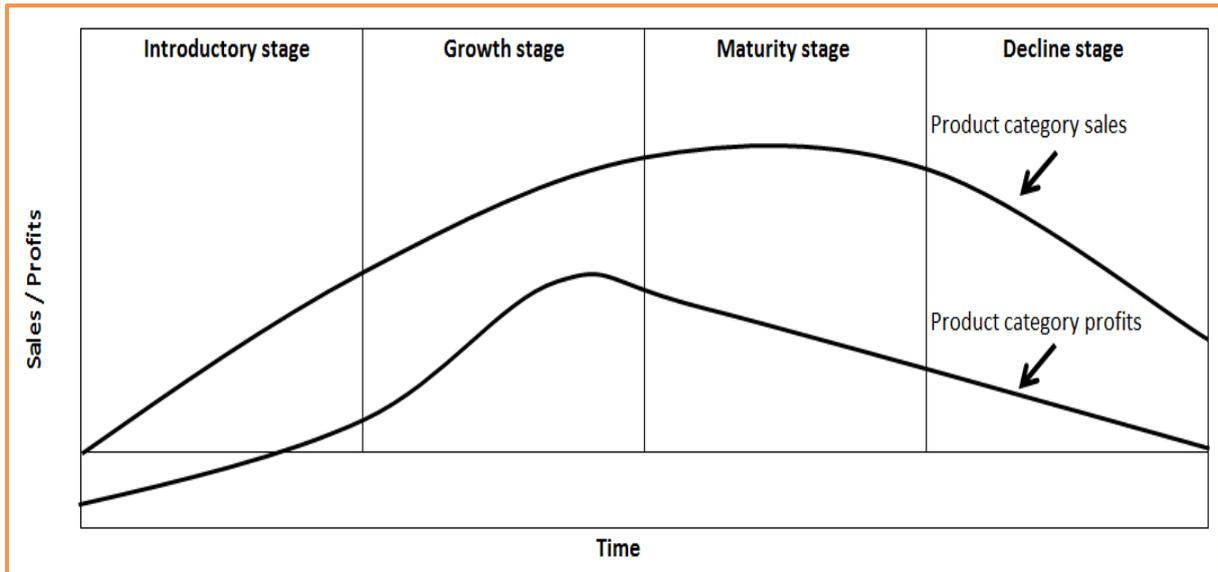


Figure 8: The product life cycle phases (figure adapted from Lamb *et al.*, 2008:245)

It is important for a company to be aware of the current product life cycles of all products. When the products enter the decline stage, sales begin to drop and customers begin to switch to new products or different brands (Lamb *et al.*, 2008:246). Strategies in the company need to be put together for each stage of the product life cycles. The different strategies are summarised in Table 7.

Table 7: Product life cycle and advertising techniques (table adapted from Lamb *et al.*, 2008:244-249)

Stages	Strategy
Introductory	Rapid skimming
	Slow skimming
	Rapid penetration
	Slow penetration
Growth	Lower prices
	Product improvement
	Packaging changes
	Product line expansion
	Distribution expansion

Stages	Strategy
Maturity	More frequent promotions Find new target markets Below market price advertisement New distribution channels Alter the product

There are numerous marketing techniques that can be used during each of the product life cycle stages: introduction stage, growth stage and maturity stage. The importance from a planning perspective is to know or to predict what the sales might do in each of these phases or promotions. Stock planning must be done for each of the product lines such as, what amounts of stock should be kept and what forward sales predictions should be made to support the stock levels that should be kept. Stock would need to be high in the introduction and growth phase and would gradually lower as the product moves out of the growth phase and into the maturity phase.

2.3.2 Demand and stock planning

2.3.2.1 Demand planning

In the environment of business and economics, a particular focus is placed on trying to accurately predict events, may these events be for short-term or the long-term (Makridakis, Wheelright & Hyndman, 1998:2). The accuracy of these predictions have become more and more important so entities can save on the main factors of time and money. By using forecasting methods, improvements can be made upon planning and the accuracy thereof.

Makridakis *et al.* (1998:3) state that regardless of all the improvements being done, the success of the forecasts is not always directed to the profitability of the entity. Secondly, it must be taken into account that there is a distinction between events which are outside the entities control (external factors such as the economy, rising interest rates or fuel prices) and events which are controllable from inside the entity (internal factors such as marketing decisions, budget decisions or promotions). Uncontrollable external events are directly linked to forecasting, while internal events are linked to decision making. These two combined is what links planning (Makridakis *et al.*, 1998:3).

The customer service of a company can have a direct effect on the demand. If the customer service of the company is of a good standard, customers will remain loyal to the company.

Bad customer service may lead to customers not returning and this will lead to a lower demand. A higher customer service may lead to higher demand (Stock & Lambert., 2001:98).

In order to know what the demand will be, demand planning needs to be done. Demand can have an impact on the company's marketing, manufacturing and logistics. Future sales forecasting needs to be done to plan for this demand and the future demand will impact the promotional strategies of the company, the allocation of the sales force, market research and pricing of the products. The sales forecast can then impact the production schedules and purchasing strategies (Stock & Lambert., 2001:20). Accurate forecasting of future demand can help determine where future resources should be allocated and how to compile budgets.

When planning for demand management, it must be taken into account how the customer's requirements will balance out with the company's supplying capabilities. As mentioned by Stock & Lambert. (2001:69), a good demand management system must take into account the point of sale data and any other key customer data which will help lessen the demand uncertainty.

There is a need to forecast, because of the time lag which arises between the awareness of a need and an occurrence of an event (Makridakis & Wheelright, 1978:4). Lead times from suppliers are not always reliable and stockholding needs to be adjusted to the variability of these lead times. If factors in the market were identifiable and lead times were reliable and short, there would almost be no need for the forecasting and planning of stock (Makridakis & Wheelright, 1978:4). Events outside the company are not controllable and a buffer needs to be built for events that cannot be predicted. In some cases the events in the company are just as controllable, and for these events, forecasting must also be done (Makridas *et al.*, 1998:3). Table 8, summarises the importance of forecasting for the short-, medium- and long term. The main reasons which are for scheduling resources, acquire additional resources and to determine what resources are needed.

Table 8: Importance of forecasting (Makridakis & Wheelright, 1978:5)

Reason	Explanation
For scheduling existing resources	Resources need to be managed effectively and efficiently such as scheduling the production of a product or the transport lead time
To acquire additional resources	Forecasting is needed to plan for lead times for future products or new suppliers

Reason	Explanation
To determine what resources are needed	Planning and forecasting for future resources that might be needed

There are several factors which need to be taken into account such as the scheduling of future as well as the additional resources needed. Forecasting also needs to be done to determine what these future resources might be in the event of new opportunities being made available to the company. An example of this may be when a retail industry decides to source a new product in the store. Planners and management need to forecast the demand of the product so the appropriate resources, such as capital or warehouse space, will be available. This forecast and investigation may also lead to discovering extra resources that might be needed, planning and forecasting should be done for these resources. Other important factors which should also be taken into account when planning for demand are the delivery lead times from suppliers, sales lead times, stock clearance rate, stock control and budgets. These factors can all have an impact on the effectiveness and efficiency of stockholding in the company when planning the reorder point.

2.3.2.2 Stock planning

Stock in a company is accumulated when a company obtains stock which is not immediately used or sold (Waters, 2003:5). Stock in the company has a stock cycle. This cycle comprises of suppliers selling and delivering the stock, the stock being held at the company and the stock leaving the company when it is bought by the customers. Stock management is needed to control the stock flow and making insightful decisions about what will work best for the company in terms of stockholding. There are numerous factors which play an important role in the current stock situation of a company such as lead time.

The longer the lead time, the higher the amount of safety stock and the higher the financial amount spent. The importance of each of these factors should be estimated by the planners by weighing the effect that each of these factors may have on stock levels and order placements. Stock clearance can also be affected by the type and price of the product. For example, at a retailer, a treadmill that sells for R25 000 will most likely have a low clearance rate, but it is still profitable for the retailer to keep low levels of stock even if the retailer only sells one treadmill a month. Therefore product characteristics should also be taken into account when planning demand.

Long lead times for a product can affect the competitiveness of the retailer, increase safety stock requirements, lower customer responsiveness and can also increase the forecasting error in demand planning (Yang & Geunes 2007:439-440). In order to plan for distributions and sales forecasts, Yang & Geunes (2007:441) advises using a continued review model for the stocking system. For this model, planners need to establish a reorder point and a policy to follow when that reorder point is reached. Lead times should also be taken into account. Merchandise planning is a systematic approach which is taken to maximise stock investment while simultaneously trying to maximise profitability (Parker Avery Group, 2013:2). The Parker Avery Group, a retail consulting group, highlights six methods for planning stock values. These are:

- Forward weeks of supply
- Weeks of supply
- Stock to sales ratio
- Sell through percentage
- Turn
- Basic stock

Forward weeks of supply allow the planner to plan for the appropriate level of stock on a weekly level. This method is essential for managing effective stock levels. The end goal of effective stock management is to have the appropriate levels of stock at any given point in time until the next drop of stock is delivered. To calculate the forward weeks of supply, the planner needs to take the planned number of weeks' sales from the next week forward which the current stock value presents. The end period of stock is then calculated by counting the forward number of projected weeks of sales and then summing the value to calculate what the value of required ending stock should be (Parker Avery Group, 2013:2).

The advantage of using the forward weeks of supply method is that the stock is directly linked to the across time sales trend. Stock levels are calculated to meet the future sales and thus the potential for an overstock situation is reduced. The disadvantages of this method, however, are that plans need to be calculated on a weekly basis and that the method assumes there are forward weeks of sales. Therefore, planners need to incorporate a statement of what should happen in the case where forward sales in the plans are not available.

Weeks of supply takes the current stock levels and divides it by the average amount of sales for a period. The simplification of the method is an advantage. The disadvantage of using this

method is that the method is not recommended for detailed planning and the method is reliant on historical sales to predict what future sales will happen in order to calculate the average stock levels (Parker Avery Group, 2013:2).

Stock to sales ratio (SSR) is used to plan for stock on a monthly level and forecasts how much stock is needed, based on the projected sales that want to be achieved. The stock and sales ratio are calculated by dividing the total stock at the beginning of a period by the sales of that period (Parker Avery Group, 2013:2).

$$SSR = \frac{\text{Total stock}}{\text{Total sales}}$$

Equation 2.2: SSR

The SSR method calculates the levels of stock needed for the planned sales to happen which minimises the potential for an overstock situation. A second advantage to this method is it can give a planner a guideline of what the annual stock turnover will be. The main disadvantage to this method is that the SSR only looks at one period at a time. The method does not take into account any sales trends that may take place over time (Parker Avery Group, 2013:2).

Sell through percentage (ST) provides the rate to the planners at which stock is consumed by the customers when comparing it to sales. The ST is seen as a KPI by the Parker Avery Group. The ST is represented by the ratio of sales for the period to the stock that was available at the beginning of that period (Parker Avery Group, 2013:2).

$$ST = \frac{\text{Total sales}}{\text{Total stock}}$$

Equation 2.3: ST

The ST allows the planner to see the relationship which exists between the sales and the stock. This can provide guidance when comparing the ratio to historical results and what industry standards are. However, as with the stock and sales ratio the ST is calculated for a single time value and does not take into account any sales trends over a period of time. The main difference between the SSR and ST ratios (which have an inverse relationship) is that SSR calculated how much stock should be held for the forecasted sales to happen, where ST

calculates the relationship of how much sales happen in relation to the amount of stock being held in the company.

Turn, also known as stock turn, refers to the amount of times it takes for the average stock to be sold and replaced over a specific period of time. This period of time is usually a year and can indicate the ratio between sales and stock. The Parker Avery Group also view turn as a KPI (Parker Avery Group, 2013:2). Compared to ST which derives the ratio of sales versus the amount of stock being held, Turn calculates how fast sales are happening before stock is being replaced again. Turn allows the company to see how fast stock is turning in the company before being replaced with new stock.

$$\text{Turn} = \frac{\text{Total sales}}{\text{Average inventory}}$$

Equation 2.4: Turn

Turn can be used as an indicator to the planning of stock. Turn targets are typically developed at the beginning of the planning process and can provide a rough estimate of what the average stock per month should be. A disadvantage to the turn calculation is that the formula uses average values which may flatten any trends that might have happened.

Basic stock refers to the method where stock ratio is calculated on what stock should be held for each month. Stock in each month should not drop below this base line. The planned sales for each specific month is used in this calculation and is then added to the basic stock to achieve the stock value at the beginning of the month (Parker Avery Group, 2013:2).

$$\text{Basic stock} = \frac{\text{Average inventory}}{\text{Average sales}}$$

Equation 2.5: Basic Stock

The basic stock method can be used for companies which have both consistent sales and stock levels. With little fluctuations, the baseline can be calculated and will be the same for each month. An obstacle with the basic stock calculation, similar to the turn method, is that the calculation uses averages and thus any trends are flattened. Another constraint to this method is that the method is best used to calculate at the lowest level of SKU's (Parker Avery Group, 2013: 2).

2.3.3 Planning for sales: Forecasting and data patterns

Forecasting can be placed in three different categories: quantitative, qualitative and unpredictable (Makridas *et al.*, 1998:3). Quantitative methods include time series analysis which can predict the reoccurrence of events when the data shows a historical pattern. Explanatory prediction methods also form part of the time series analysis. Explanatory models show what the effects were on a product when explanatory variables, such a price increases, were in play (Makridas, *et al.*, 1998:3). Qualitative methods can be used when there is a small amount of quantitative information available, but enough qualitative information is available (Makridas *et al.*, 1998:3). When a new product is introduced in the hockey department planners use the available qualitative information to predict what the sales of the new product will be.

The final type of forecasting Makridas *et al.* (1998:8) describes as unpredictable forecasting. This is when there is almost no product information available. An example of this would be when a new department is opening in the retail company and there are no previous historical sales (quantitative data) or no qualitative information available. Makridas *et al.* (1998:9) states that quantitative forecasting can be applied when these three conditions are seen:

- 1) There is information from the past available.
- 2) The information gathered can be quantified in the form of numerical data.
- 3) The assumption can be made that some of the aspects of the pattern will continue in the future.

When using these methods in high volatile demand and random variability marketplaces these methods, however, also have their downfall (Huang, Chang & Chou, 2008:3223-3224). Huang *et al.* (2008:3226-3232) uses detailed steps to calculate demand.

- Collect the historical demand data required to do the forecasting for the given products.
- Conduct a demand behaviour analysis to create the awareness of the shifts, patterns and regularity of the demand.
- Make use of a demand forecast model to calculate the demand.
- Calculate the parameters estimation.
- Simulate the demand.
- Calculate the expected demands using forecasts (include all the risks and capacity planning in the calculations).

Various planning and forecasting techniques are available for professionals to use in the industry. The most common forecasting techniques are quantitative and qualitative forecasting techniques. As mentioned, quantitative techniques can only be applied when certain criteria is fulfilled.

As mentioned by Makridakis *et al.* (1998:9), quantitative forecasting techniques vary from model to model. Each different technique has their own types of properties, costs involved and accuracy. These techniques can fall into different types of categories, such as being intuitive or formal which are methods based on statistical principles. Intuitive forecasting techniques have decreased in use as the accurate available information for these models are little or none (Makridakis *et al.*, 1998:9). Some entities do, however, still use these models simply because the entities are not aware of other available models or they are more comfortable with using judgemental techniques (Makridakis *et al.*, 1998:9).

Statistical quantitative methods can use historical data and predict future sales based on historical trends. Makridakis *et al.* (1998:9) mentions that individuals who are unfamiliar with these types of methods, may be under the impression that the models cannot predict the future. This is correct in some sense, but as Makridakis *et al.* (1998:10) describes, where historical data has a pattern, that pattern is bound to repeat itself in some sense.

When collecting data to use for forecasting, certain criteria must be in place or the outcome of the prediction may be unreliable. Hanke, Wichern & Reitsch (2001, 53) provides a few guidelines that must be followed when choosing the data that will be used in a forecast:

- The data should be reliable and accurate.
- The data should be relevant to the forecasting that is being done.
- The data should be consistent.
- The data should be collected in a timely basis.

2.3.4 Choosing which method to use for forecasting

Makridakis *et al.* (1998:13) provides a five step guide that should be followed when choosing a forecasting technique.

1. Define the problem

Before choosing a forecasting technique, it should be understood as to why this forecast is needed, who will use this forecast and how the overall forecast will fit into the current organisation. All the relevant information that could have an effect on the

forecast should be thoroughly investigated and understood before deciding on a method (Makridakis *et al.*, 1998:13).

2. Information gathering

The information that should be gathered must be what will be needed and used to do the forecast. Past data should be collected if this is available and necessary. This type of data is usually expressed in numerical and statistical values. Data from other sources must also be collected such as quantitative data that are available from experts in the field, key personnel and managers. Any items of interest that may have an influence on the forecast must be collected (Makridakis *et al.*, 1998:14).

3. Conduct an explanatory analysis

The data which were gathered in step two must be examined and a conclusion should be made. The manner in doing should be graphical as well as statistical. Visual methods can be one of the most influential methods that can be used as it allows the forecaster to see patterns and trends in the data. Statistical methods help to interpret these visuals. Calculations such as the mean, minimums, maximums and standard deviations must be calculated (Makridakis *et al.*, 1998:14).

4. Choosing a model that would be fitting

When choosing a model the length of the forecast must be taken into account. Will the forecast be used for short-, medium- or long-term forecasting? For long-term forecasts, less than formal approaches, such as statistical methods, are used. Long-term forecasting calls for analogies to make predictions based on similar scenarios which might have taken place in the past (Makridakis *et al.*, 1998:446). Scenario building might also be necessary when forecasting in the long-term. In this case, judgemental decisions are made on subjective interpretations and challenges conventional thinking (Makridakis *et al.*, 1998:472). For short or medium length forecasting, quantitative methods can be chosen based on the explanatory analysis that was conducted. Questions that should be asked are, “Did the data show trends?”, “Was there a linear trend or seasonal trend in the data?” and “Must the data be smoothed to be used in a forecasting method?” Once this has been done, an appropriate forecasting method can be chosen.

5. Evaluating and using the model

Once the model has been chosen and applied, the accuracy and usefulness of the model will only become apparent when the forecasted data become available. It will then be possible to evaluate the performance of the model and to see if the errors which occurred from the model are justifiable (Makridakis *et al.*, 1998:15). A performance measurement that should be used would be to calculate the errors which occurred during the models forecast. Measures such as the mean absolute percentage error (MAPE), relative absolute error (RAE) and the mean square error (MSE) should be calculated (Kalekar, 2004:1).

2.3.5 Trends in data

In some cases, patterns in data can much easier be spotted when displaying the data graphically. There are four different types of patterns that can be seen when displaying data graphically, these are, horizontal, trend, seasonal and cyclical (Hanke, *et al.*, 2001, 54). Horizontal patterns exist when a constant level of observations waver around the same level of mean (Hanke *et al.*, 2001:54). Products which show a consistency of the same monthly sales, such as the sales of bread, will show a horizontal trend in sales.

Seasonal patterns are most observed with sales that tend to have a seasonal pattern. These sales tend to increase when a product is in season, and tend to decrease when the product is out of season. Cyclical patterns are in most common cases influenced by economic changes (Hanke *et al.*, 2001:54). Product can sell less or more due to factors such as interest rates, inflation and exchange rates.

2.3.6 Stock and stock control

Companies keep stock to overcome the uncertainty between supply and demand. Stock allows operations in the entity to become more efficient and productive. Stock also has a direct impact on factors such as lead time, customer service, operating costs and profit (Waters, 2003:100). The important question managers therefore need to ask is not do we need to carry stock, but how can the stock be managed in order to take advantage of the potential efficiency of carrying stock. Supply chain management and planning will carry the responsibility for the movement, procurement and storage of the stock and what type of inventories should be held. Planning and management are needed to find the balance between

the most efficient method of carrying stock so the entity and customers will keep on benefiting from the stock being carried. With this the cost of keeping stock and the levels of customer service must be considered (Waters, 2003:14).

To plan for a more efficient stockholding and supply chain, Waters (2003:14) recommends beginning by investigating the current supply chain of an entity to see where lost opportunities may be or to realise where improvements are needed. Waters (2003:14) recommends following and starting with the following guidelines:

- Analyse and find the aims of the current logistical strategy.
- Examine the current operations in the entities and identify their shortcomings. Find ways or ideas to overcome these shortcomings.
- Create an outline of the current structure of logistics and find the number of facilities, best locations, modes of transport and investment of stock.
- Set up detailed plans for stockholding, facility size, material handling and transport, equipment needed, systems which may need development, number of employees needed and transport needs.

As long as there is uncertainty in demand, entities will keep stock. This uncertainty encourages entities to carry higher stock than necessary which of course has its disadvantages, higher costs (Waters, 2003:17). This decreases the responsiveness in the chain when there are fast changes that need to be done. Waters (2003:17) uses the example of a new product being introduced. Demand has grown for a new product, but the entity still sits with all the old stock or the previous model which the customers do not want anymore. Entities then need to react fast by introducing smart marketing ideas, such as promotions on the old stock, so the customers will be encouraged to buy the old stock at a discounted price. Only when the old stock is beginning to move out of the entity can the entity order the new products. These problems can be avoided by co-ordinating the flow of materials and stock in the entity. Benefits, as described by Waters (2003:17) to better co-ordination of material flow include:

- **Lower costs** - entities can carry less stock which will in turn lower the costs involved in keeping stock, economies of scale can be achieved and less expenditure.
- **Improved performance** - higher productivity, stable operations and better planning can be reached.

- **Improvement of material flow** can be reached with more co-ordination which will lead to faster and more reliable movements.
- **Improved customer service** - shorter lead times and faster deliveries.
- **More flexibility** with the entity reacting faster to changing conditions.

In order to reduce costs, better material flow and co-ordination, it would be necessary to build up a relationship with the members of the supply chain involved, such as the suppliers. The difficulty in this lies in trust. Most entities do not trust the members involved in the supply chain and are in most cases reluctant to share any information in the fear that members may use this information for self-gain. Integration for most entities is not an easy step due to the traditional view of entities being oppositions (Waters, 2003:17). Entities struggle with loyalty and are in most cases on the lookout for a better deal. This means changing suppliers on a regular basis, unreliable number and sizes of orders and no guarantee of future business (Waters, 2003:18).

2.3.6.1 The role of stock

Stock volume in the entity is not purely for customer satisfaction or for meeting demand. Stock also carries a strategic role in the entity. Stock can greatly affect the decisions within the entity. The different decisions that need to be made can be strategic (long-term), tactical (medium-term) and operational decisions (short-term). Traditionally, managers decide on strategic decisions which then roll out to tactical and operational decisions to achieve the strategic goals in the entity (Waters, 2003:37). Figure 9, illustrates all the strategic decisions that generally take place in an entity.

The mission of the entity is the overall aims which the entity would like to achieve with the stock. The corporate strategy is how the aims will be achieved, where the business strategy will show, and how each business in the entity will contribute to achieving the corporate strategy. Functional strategies will describe the strategic direction of each of the functions and the functional strategies each lead to tactical and operational decisions in each function.

stock can lead to lowering the operating cost of the entity and an increased profit margin (Waters, 2003:45).

2.3.6.2 The order cycle

The time that elapses from the order cycle can directly impact the stock levels. The shorter the order cycle time, the less stock needs to be kept. Longer order cycle times means bigger amounts of stock that needs to be kept. The order cycle time is the time that elapses from when the order was placed to when the goods are delivered. Stock levels can only be optimised (by keeping lower stock levels which in turn means lower costs of keeping stock) if the order cycle time is reliable and, or short (Langley, Coyle, & Gibson, 2008:53).

With reliable order cycle times, retailers can plan forward how much stock needs to be kept until the next order arrives. The same can be said for short order cycle times. Langley *et al.* (2008:53) argues that such cost reductions can be just as important as price reductions in the company.

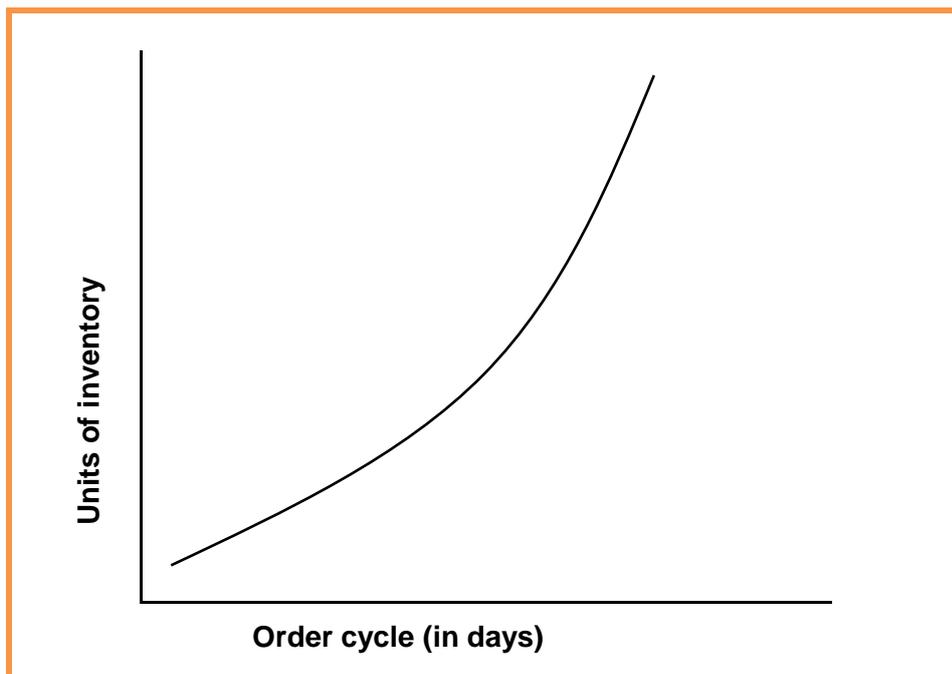


Figure 10: The relationship between order cycle times and stock (figure adapted from Langley *et al.*, 2008:53)

Figure 10, shows the relationship between the required stock levels and the order cycle time from the perspective of a customer. It can be seen that the higher the amount of days in the order cycle time, the higher the amount of stock levels in the company. Products which have high competitive substitutes are likely to be more customer service sensitive (Langley *et al.*, 2008:54). Consumers can easily switch products for a substitute product when the one which is preferred is not available. Langley *et al.* (2008:54) therefore states that customer service is

more important for such high competitive substitution products. Customers might be willing to wait for the products if the lead times of the order are low (Langley *et al.*, 2008:54).

Langley *et al.* (2008:54) states that an inverse relationship exists between the cost of lost sales and the cost of carrying stock. It is also stated that companies are in most cases willing to increase the stock cost until the point where total costs begin to increase. These companies are also willing to spend more on stock costs to lower the opportunities loss with lost customer sales (Langley *et al.*, 2008:54). Figure 11, explains the relationship which exists between the increasing of stock, which can to a certain extent lower the cost of lost sales (Langley *et al.*, 2008:54).

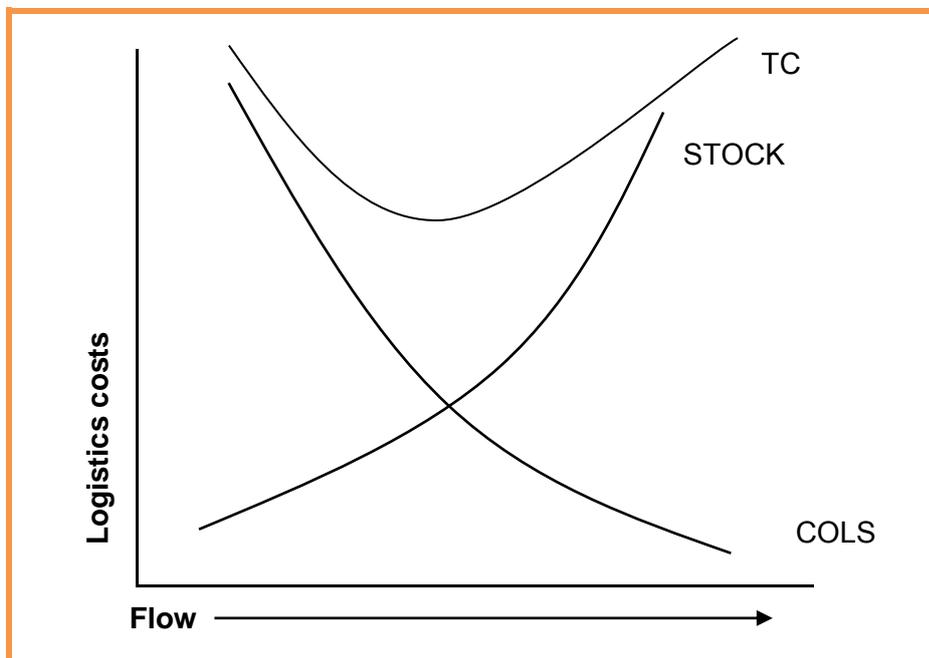


Figure 11: The relationship between stock costs and cost of lost sales (figure adapted from Langley *et al.*, 2008:54)

Where:

TC = Total Costs

COLS = Cost of lost sales

Another method to minimise the cost of lost sales is by increasing the transportation costs. Examples of increasing transportation costs can be to acquire a better logistics service or by paying extra to get the product to the customer faster (overnight courier costs or air freighting a product). Figure 12, summarises this relationship.

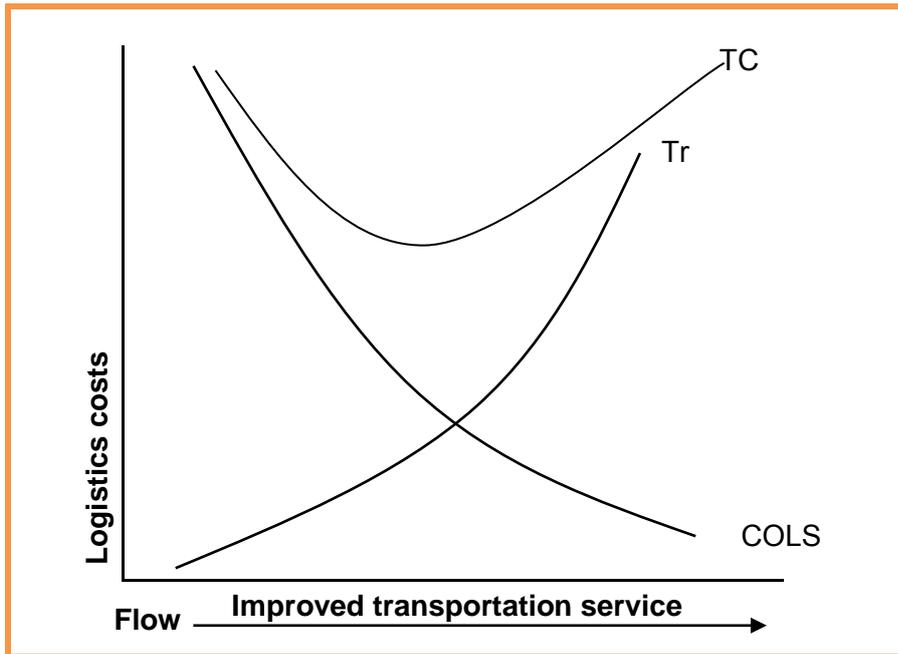


Figure 12: The relationship between cost of lost sales to transportation costs (figure adapted from Langley *et al.*, 2008:54)

Where:

Tr = Transportation costs

2.3.6.3 Fundamental stock questions

In the world of stockholding, the basic questions managers ask are (Waters, 2003:56):

- What items should we keep in stock?
- When should we place an order?
- How much should we order?

As seen in Section 2.3.6, the higher the stock levels the lower the return on assets will be. Increased stock levels can also affect an entities profit margin and by keeping the most efficient levels of stock, an entity can benefit financially. Items that should be kept in stock should be at reasonable levels with no unnecessary items on the stock list (for instance stock that is not selling) and these items should be removed from the stock list as soon as possible (Waters, 2003:56). Stock should be under constant evaluation. This will ensure that any items that are not efficient will be identified. To keep efficient levels of stock, entities should not only annually review the stock situation, but should do so on a monthly basis. Any non-efficient items of the stock will be more quickly identified and thus action can be taken more rapidly. Only items providing a benefit to the entity should be kept in stock (Waters,

2003:56). An easy way for managers to manage stock is to have a regular stock policy in place. This will ensure frequent reviewing of the current stock, which will help managers and planners identify the stock items which are not selling or stock which are inefficient for the company. Stock which are not selling and inefficient for the company should thus be removed from the stock list, given that these items are not strategically placed in the company. This in turn will lower the stock levels of ineffective products in the company.

To decide when to place an order is also a decision managers need to focus on. Waters (2003: 56) describes three approaches that will help with this decision. Firstly, orders can be placed periodically; orders are placed at variant times depending on the quantity needed and the size of the order will depend on the variance of demand. Secondly, is a fixed order quantity. Orders are placed in a fixed amount when a certain level of stock is reached. This approach will not fit in an alliance with a supplier who expects regular orders from the entity. If the demand is too volatile and no sales have been made, no additional orders will be placed. Thirdly, Waters (2003:57) describes using a supply approach. In this case, enough is supplied to meet the known demand, but this approach also has its downfalls as demand can be volatile and not easy to predict. If the demand is not known, then the wrong amount of stock will be ordered thus leading to understock or overstock situations. In these cases where demand is known and dependent, the supply approach is easier to implement.

2.3.6.4 Determining the size of the order

Once a re-order point has been established, there needs to be decided what amount should be ordered. Numerous methods are available to calculate the order amount. The most widely known is the economic order quantity (EOQ). The EOQ is the quantity of stock that should be ordered at the most optimum levels of total costs and variable costs (Baily, Farmer, Crocker, Jessop & Jones, 2008:165). Baily *et al.* (2008:166) warns that the EOQ should not be applied to unstable circumstances as the EOQ may lead to the wrong quantities being ordered. Burt, Petcavage & Pinkerton (2010:488) describes that the EOQ can specify what the appropriate order quantity should be to minimise all the costs related to the order, carrying costs, acquisition costs and the cost of the ordered goods.

When placing re-ordering quantities, planners have different choices as to when to place orders. These can either be time based, quantity based or demand based orders (Bernard, 1999: 221). Orders which are placed on a time based perspective are placed without considering the current stock or the demand profile. When orders are placed on a quantity basis, the current stock is taken into account. This type of ordering occurs when the stock has

dropped to a level below the safety stock requirements or an out-of-stock situation will occur before a new order will be received. These re-order points can be triggered on a system which has been programmed to calculate the re-order point and notify the planner (Bernard, 1999: 221).

Bernard (1999:285) mentions that there are a number of techniques which can calculate how much should be ordered, however, the difficulty comes in knowing what technique should be applied, how to apply the technique and how to apply the trade-offs which are associated with that technique. Bernard (1999: 285) states that it should be up to the planner to decide what quantities are correct to order as they get the overall business operations and objectives set. The planner should constantly be aware of any changes that are happening in the company as to modify the order quantities. Table 9, summarises the different categories of ordering quantities. The order quantities can fall into four categories, namely economic, time frame, quantity and demand.

The economic order quantity is based on a technique where the ordering costs and the cost of carrying goods are expressed in a calculation. The disadvantage of using this technique is that the cost of carrying goods and the cost of ordering must be very precise to avoid inaccurate stock level decisions. The ordering point is based on whether the ordering cost is equal to the cost of carrying the goods (Bernard, 1999: 287). The common equation for calculating the EOQ is shown in Equation 2.7 (Burt, Percavage & Pinkerton, 2010:490).

Annual carrying costs = Acquisition costs

$$CC = AC$$

$$\frac{QCI}{2} = \frac{AU}{Q}$$

To solve Q:

$$Q^2CI = 2UA$$

$$Q = \sqrt{2UA/CI}$$

Equation 2.7: Economic order quantity

Table 9: Different types of order quantity techniques (table adapted from Bernard, 1999: 287)

TECHNIQUE	FIXED ELEMENTS	VARIABLE ELEMENTS
Economic	Cost	Time frame quantity
Time frame	Time frame	Demand and order quantity
Quantity	Order quantity	Demand and time frame
Demand	Time frame and/or demand	Order quantity

The time frame quantity is based on the demand which arises inside the time frame. The demand and the order quantity are the two variables which are taken into account. The ordering quantity is calculated from the demand which occurred within a certain time frame (Bernard, 1999: 288). In the quantity order, each of the orders are the same quantity and the time frame which is used is variable based on the variability of demand. This technique is more commonly used with items that require pack sizes (the goods can only be ordered in certain pack sizes such as, 12, 24, 100).

The demand order quantity is specifically based on a forecast of demand or a specific demand that came from a customer. The time frame or demand can be fixed elements as the demand can arise at a specific point in time which needs to be met. The order quantity can vary as the demand will determine what size the order will be.

2.3.6.5 Buffer or safety stock

For numerous factors such as, unreliable delivery times, volatile market and geographically separated suppliers and customers it is necessary to carry safety stock (Stock & Lambert, 2001:230,232). Companies thus carry more amounts of stock than necessary to overcome time and place utility (Stock & Lambert, 2001:230). Bernard (1999:59) describes that safety stock help companies to reach the targeted customer service levels.

Stock & Lambert (2001:232) describes that companies can have two reasons to increase safety stock, variability in demand and /or variability in lead times. Both these scenarios are reasons why companies increase the amount of safety stock. Figure 14, is an example of how both demand and delivery times can vary.

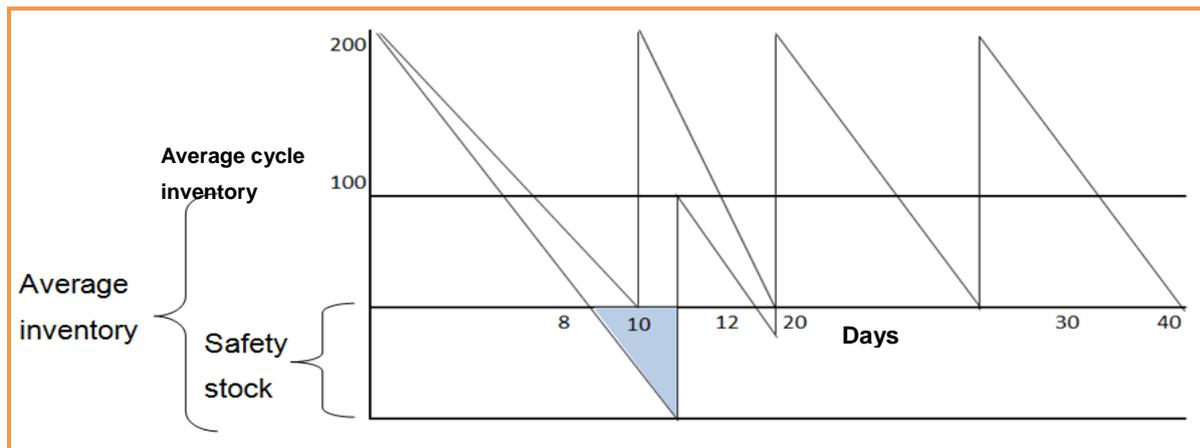


Figure 14: The average stock investment under conditions of demand and lead time uncertainty (figure adapted from Stock & Lambert., 2001:234)

If lead times or demand is variable and not delivered on a consistent basis, sales will flow into the safety stock of the company. The amount of safety stock a company carries will result on how variable the demand or lead times may be. Safety stock is calculated by the company in the amount of days' stock that would be necessary for no sales to be lost until the next delivery arrives.

2.3.6.6 The bullwhip effect

Burt *et al.* (2010:532) describes that bloated stock levels can be caused by the failure to accurately estimate demand or by not sharing information between the supply chain entities. This poor sharing of data, forces supplying companies to carry more stock than necessary or to increase the lead times to make up for the uncertainty (Burt *et al.*, 2010:532).

The bullwhip effect is essentially caused by misinterpreting data due to uncertainties. When the buyer (in this case study, the planner) places larger than the norm order quantities due to long lead times, the supplier then interprets this information as an increase in demand. The supplier takes action by increasing the capacity and production due to the rise in this fictional demand. With the increased capacity the actual demand takes a drop in sales which leads to the buyers' company being overstocked and the supplier being overstocked. The bullwhip effect can also start with the customer where there was a once-off inflated demand (Burt *et al.*, 2010:532). Figures 15 to 18, explain the effects of the bullwhip.

To help companies represent data in a graphical format, programs such as Tableau can be used. Tableau is a drag-and-drop product which can easily be used to import data sheets, for example from Microsoft Excel, so data can be represented from a visual aspect (Tableau, 2013). It is a self-service business intelligence application which can be used to answer business questions. The program helps users to use live, interactive and visual windows into all of the company's data (Tableau, 2013). Data can be represented in any graphical format and can also be combined in dashboards.

2.3.8 Supplier relations

The days where the relationship between the buyer and the supplier were based on manipulative and tactical schemes are long gone (Burt *et al.*, 2010:65). As the purchase industry moved towards a more professional industry, the buyers and suppliers came to see the benefits in collaborative relationships. These relationships took on a win-win situation as opposed to the traditional win-lose relationship (Burt *et al.*, 2010:650).

There are three different types of supplier-buyer relationships (Burt *et al.*, 2010:65-71). These are: transactional, collaborative and alliance relationships. The transactional relationship is the most basic of the relationships. These relationships have no benefits and parties involved are not concerned about the well-being of each other. Parties can move from one contract to the next without building a long-term relationship. Transactional relationships do have advantages such as lower skills needed in the personnel involved and less time spent deciding on prices. Disadvantages also exist, such as the potential for communication, delivery and transactional difficulties (Burt *et al.*, 2010:67).

The second type of relationship is collaborative. In the collaborative relationship, the awareness for interdependence and the necessity for cooperation exist. Collaborative relationships include trust building, joint efforts and communication. There is also the improvement on costs and quality. The one big disadvantage that comes with collaborative relationships is the time, effort and skills needed to build and manage such a relationship (Burt *et al.*, 2010:70).

The final type of relationship Burt *et al* (2010:70) discusses is the alliance relationship. The main difference described between the collaborative and alliance relationship is the presence of institutional trust. The lack of institutional trust is one of the main reasons why so many supply alliances fail (Burt *et al.*, 2010:70). Benefits from alliances include lower costs, faster time to market and improved quality on new designs of experiments. A downfall to this type

of relationship is the amount of intense resources that need to be involved during the course of the relationship. Table 11, is a summary of the characteristics of the three different types of relationships.

Table 11; Three types of buyer-supplier relationships and their characteristic (table adapted from Burt *et al.*, 2010:66)

Attribute	Transactional	Collaborative	Alliance
Communication	High potential for problems		Systematic approach to communication
Competitive advantage	Low		High
Connectedness	Independence		Interdependence
Continues improvement	Little		A focus
Contributions to new products	Few		Many: early supplier involvement
Difficulty of exit	Low		Difficult: high impact
Duration	Short		Long
Expediting	Reactive		Proactive
Focus	Price		Total cost
Level of integration	Little or none		High or total
Level of trust	Low		High
Number of suppliers	Many		One or few
Open books	No		Yes
Quality	Incoming inspection		Design quality into systems
Relations	Inward looking		Concern with each other's well-being
Resources	Few: low skill level		Professional
Service	Minimal		Greatly improved
Shared forecast	No		Yes
Supply disruptions	Possible		Unlikely

dissatisfied employees can have on a company. For instance, Robbins & Judge (2010:117) have a framework in the case of job dissatisfaction. There are four possible responses when employees are dissatisfied in the workplace, exit, voice, loyalty and neglect. The exit response can lead to an employee resigning when experiencing job dissatisfaction where the voice response includes steps where the employee actively and constructively tries to improve the working conditions (Robbins & Judge, 2010:117). Loyalty refers to the response where the employee will wait for working conditions to improve. This is seen as a passive response. The employee will defend the company when criticism is present and will also trust the company to “do the right thing” (Robbins & Judge, 2010:118). Neglect is also seen as a passive response where the employee allows the conditions in the company to worsen. Neglect can include the employee purposely staying away from work, increased errors in work and reduced work effort.

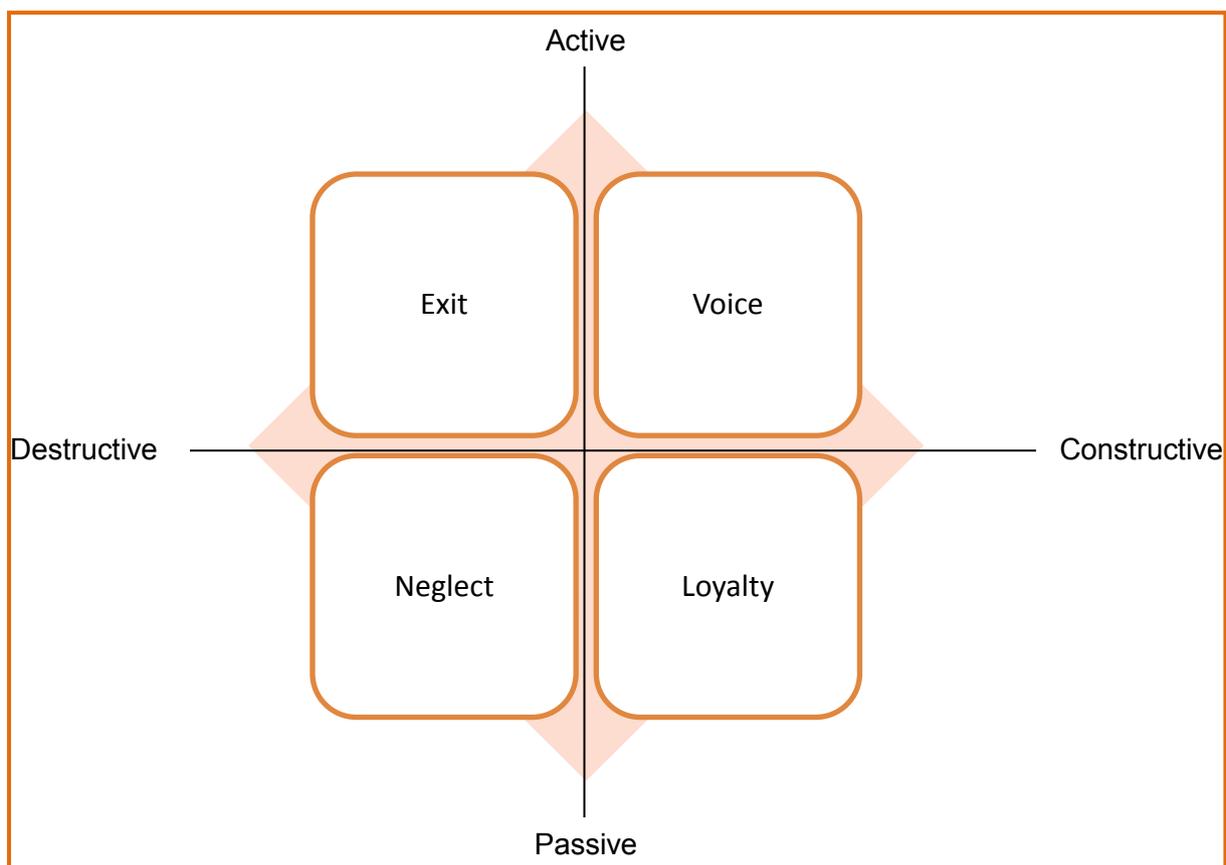


Figure 21: The responses of job dissatisfaction (figure adapted from Robbins & Judge, 118:2010)

For a retailer to be successful, retailers must be able to retain (and recruit) a competent workforce (Chung, Rutherford & Park, 2012:699). To do this, retailers must be able to recruit and train employees while trying to reduce the overall costs involved with recruiting, training

and retaining employees. Retailers must understand how to build levels of employee job satisfaction to reduce employee turnover, which in turn can decrease the costs of recruiting. To keep employees from the exit response, a company must understand why it is important to retain employees (planners). Table 12, summarises the beneficial aspects of retaining employees. Fewer costs can be spent on recruiting and the quality of work plus work productivity will be improved if companies do not have to train new employees on a frequent basis. Employees can also develop within a company and attain more skills which in turn will help the company. Overall, the morale and culture of a company will be more positive if there is less staff turnover.

Table 12: Benefits of retaining employees (State Government of Victoria, 2012)

Benefits of retaining employees
Costs savings
Improved quality and productivity of work
Positive staff morale and satisfaction
Client benefits
Ongoing development of skills and knowledge
Continuity of employment
Positive organisational culture and values

2.3.11 Deduction made from literature

The literature overview provided insight to SCP and what can be used to determine the importance of planning in the supply chain. Copious amounts of studies have been conducted to support professionals in the SC field. SCP literature and SCP studies provide guidelines for professionals to follow.

The literature provides insight to the importance of certain aspects in the supply chain such as stock, ordering, data interpretation, advertising promotions, demand planning and forecasting. It can be seen how each of these aspects play a role in SCP and the effects can be seen when planning is not done holistically. There are SC processes and activities which need to take place in the supply chain and each of these aspects must be part of the supply chain planning strategy. The supply chain strategy must take into account the current and future state of the

company. The current and future state of the company must be explored and the future state must be communicated, as well as how to reach the future state.

Chapter 3 Data analysis and findings

The following chapter provides the relevant insight to the findings and analysis of the company. It will provide insight to the reader as to how the company operates in terms of supply chain planning, the planning processes and activities that are executed and planned for in the company. The findings and analysis of each respective topic in supply chain planning is discussed and analysed based on the theoretical qualitative data gathered in Chapter 2.

3.1 Sales and Operations Planning

Sales and operations planning is the tactical process of bringing all the plans of the company together into one aligned plan to support the business strategic goal (Milliken, Fall 2008:4). Twice a year, a team of buyers, planners, managers and executives in the company meet for a S&OP meeting. The goals and objectives of the meeting are summarised in Table 13. Each planner and buyer for a category meets in advance to discuss the goals that should have been achieved in the previous S&OP meeting. The team also discusses what new goals and objectives should be targeted in the new upcoming S&OP meeting. These goals and objectives are all documented. During the meeting, buyers, planners and managers strategise on what the next step (goals and objectives) in S&OP should be. Table 13 summarise the goals and objectives for the S&OP meetings. The performances of categories are discussed and future potential for a category is established. Stock and sales are also mentioned while buyers comment on the service suppliers are providing.

Table 13: Goals and Objectives for S&OP meeting

S&OP meeting goals and objectives
Establish current range performance
Establish growth from last year's sales
Identify competitors in the market
Analyse price and product competitiveness
Identify opportunities in the market
Department category goals and objectives for the following months and year

S&OP meeting goals and objectives

Evaluate supplier response and reliability

Monitoring over- or understock situations and strategising solutions

Goals and objectives which are set must be achieved by the next S&OP meeting or by the end of the financial year. These goals and objectives can be for the short- or for the long term. If a certain category is performing very poorly or very good a lot of focus is placed on this category and all angles are evaluated to explain the category's current performance. Questions which are asked during these sessions include, 'How can we improve this category?', 'What are our opportunities to grow this category?' and 'What are our competitors doing?' After the S&OP meeting, each planner and buyer are responsible to reach the set out goal for their respective category. These goals and objectives are tracked during the year to evaluate at the next S&OP meeting.

These meetings however are generally very rushed and focus may sometimes be misguided into the wrong direction. A large amount of time is spent on the past performance of a category (net sales achieved this year compared to net sales achieved last year) and how the sales for that category can grow going forward. In some cases, it was observed that a considerable amount of time in the S&OP meeting was focused upon one specific category, which left little or no time for the buyers and planners of other categories to discuss their relevant department. All critical resources are not being focused on in these meetings and it can be advised that more structure and communication should be used to make the meetings more effective for everyone present.

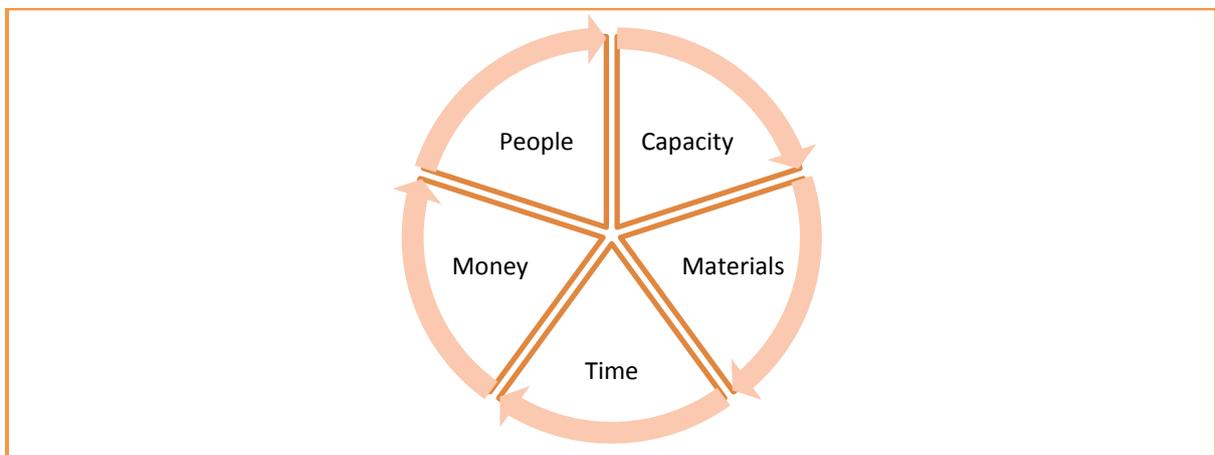


Figure 22: Critical resources in a company (Hitachi, 2007)

Focuses on KPIs in the S&OP meetings were not high and KPIs such as Gross Profit Return on Space (GPROS) and on Gross Profit Return on Stock (GPROI) should be used to measure profits. As of now, these meetings are only focussing on this year's sales versus last year's sales. Very little emphasis is placed on the reliability of suppliers. This is a topic that can be discussed in more depth as it was observed that unreliable suppliers have effects such as missed sales opportunities. The S&OP meetings should include relevant discussions and action plans on supplier reliability. A good example of action plans for suppliers is reference to the article "*Tesco puts poor-performing suppliers in 'intensive care'*" by Rick Pendrous. Tesco puts some underperforming suppliers in "intensive care" or "life support" with regular follow-ups about the performance delivery the suppliers are providing. Suppliers were given strict warnings and action plans to improve upon their service delivery and performance. In one year, Tesco's service delivery increased by two percentage (Pendrous, 2007:5).

3.2 Promotions

Promotions are conducted monthly on certain products. The products are chosen by the buyer, with inputs from the planner. Planners will identify products to the buyer which are selling exceptionally well, or products which are selling poorly. Promotions are held to boost sales, attract customers or to get unwanted products cleared out. It can also be held to help a supplier clear excess stock.

Planners are responsible for planning the sales of the promoted items for the period when the promotion is running. To do this, planners need to forecast and predict how many units will sell in the promotion - a difficult task. It is difficult to predict how the customers will respond on a promotion. Is the discount on the items enough to attract customers or is the discount too little for the customer to get a deal out of it? These questions must be asked when planning the sales of the promotion.

Planners base the forecast of the predicted sales during a promotion on how well the product was selling in normal circumstances. Normal circumstances are defined as: there are no current promotions running on the product and the product did not have a sudden boost in sales due to a market trend. The normal sales of the products are studied and evaluated and planners estimate by what percentage the sales will increase by when the promotion is running. This percentage can be a qualitative guess or planners can look at how similar products performed in a previous promotion. The percentage of increased sales will then be based on how well the similar product performed.

It is important for planners to forecast the sales of promotions as this directly affects the discount spent on products. Budgets are given at the start of each year for how much discount can be spent on promotions per category. It is the duty of the planner and the buyer to know how much discount can be spent each month on promotions.

The discount spent is calculated as follows:

Normal selling price:	R400
Promotion price:	R350
Save:	R50
Sales:	80 units
Discount spent:	Sales x Save R amount
	=80 units x R50
	=R400

The total discount spent is calculated on the estimate the planners give at the beginning of the promotion. However, this discount and the promotion still need to be approved by the planning executive and the executive manager. Once the approvals have been given and the promotion is up and running, the discount spent will be revised each day until the end of the promotion to calculate the accurate discount that was spent.

If the discount spent is under the budget the planners can use the extra amount on a different promotion for the same month, or they can add the extra amount to the next month's discount budget. It is not compulsory to spend the entire discount budget that is given in a year. If sales are overall low for the company and targeted sales are not reached according to what was planned for in the budget, the discounted budget will be pulled back and fewer discounts will be given for the planners to use.

Two observations were made on promotions, buyers and planners do not always check the availability of the products from the suppliers before planning a promotion on specific items. The overall stockholding in the business is checked, but when new items are on promotion the buyers and planners do not frequently check the availability of the products from the suppliers. The second observation includes products which are entering the maturity phase of the products' life cycle. Often when products reach the maturity stage, only one option is seriously considered, discounting the product. It can be recommended that other strategies

can also be taken into account before discounting the product. Strategies include finding new target markets for the product or new distribution channels. The products can also be repackaged to create a fresh look for the customers.

3.3. Demand planning and replenishments

3.3.1 Forecasting for demand and sales

The retail company forecasts sales based on previous performance of a category or product (in the case where there are previous sales available). The previous years' net sales for a specific category will be used to forecast the current year's net sales for the same category. The planners will look at an average of two years' history of net sales for a specific category and estimate the amount of growth the category will have in the current year based on qualitative and quantitative data available. Table 14, shows an example of how the net sales of a category will be calculated.

Table 14: Forecasting of net sales example

Category	Month and Year	Net Sales (000)	% Growth
Hockey Sticks	March 2010	150	-
Hockey Sticks	March 2011	160	6%
Hockey Sticks	March 2012	*170	*6%

Where '*' refers to the forecasted amount.

By using quantitative data, planners will estimate the future net sales of a category based on previous net sales results. In the example shown in Table 14, the net sales for the year 2010 and 2011 were R150 000 and R160 000. As the net sales have increased with R10 000 from year 2010 to year 2011, planners will then assume that the following year might show the same results, therefore increasing the net sales from R160 000 to *R170 000 for the year 2012. This will lead to an increase of *6%. If this percentage comes across too low or too high, the planner will use judgement as to whether a 6% increase will be viable or not. Planners can then increase or decrease the 6% to a more realistic number that might be achievable. Here planners rely on qualitative knowledge and experience to judge a category's growth. Cyclical patterns are, however, not taken into account when forecasting is done.

In the case of demand planning, much of the same thought pattern is used. Previous sales trends of products are investigated and a percentage of increase is applied to the products

forecasted sales. Planners also use the net sales results from previous years to estimate the sales results of certain products. An example of this is shown in Table 15.

Table 15: Forecasting of hockey sticks units example

Product	Month and Year	Unit Sales	% Growth
Hockey Stick A	March 2010	112	-
Hockey Stick A	March 2011	120	7%
Hockey Stick A	March 2012	*128	*7%

In the example shown in Table 15, planners investigate the sales units of a particular hockey stick in the year 2010 and 2011. Here the planners can see that the hockey stick showed an increase of 7% in sales (point of sale data is used) and, in a stable environment, the planners estimate the forecast of the sales in March 2012 will most likely be 7% as well, which is an increase to 128 units. Planners also tend to look at the net sales of the whole category, i.e. Hockey Sticks. In this case, the planners investigate the growth of the category Hockey Sticks over a period of historical months. For example, if the net sales growth from February 2011 to March 2011 was 4%, planners would then increase the predicted sales results for March 2012 using a 4 % increase in the sales units from February 2012 result, rather than using a 7% increase as shown in Table 15. The professional and qualitative judgement of planners in this specific retail company is weighed upon heavily.

Planners are expected to review sales predictions on an almost daily basis to get the most accurate results. The problem with this can be that there is no consistency or steadfastness in forecasting. On a monthly basis, planning meetings are held with the planning executive to review current month sales and stock and forecast stock and sales.

Figure 23, compares what one specific planner was forecasting to sell of one specific product in the year 2013 and what the actual sales were in the year 2012. As seen in Figure 23, the planner predicted the sales to be slightly higher than the previous year. This can be that the growth trend in units sold for the year showed that the product was increasing in sales or that the company decided to push the sales of the product. In some cases, the company may decide to make a brand more prominent in the company or to build the brand up. In these cases, the planner must increase the stockholding of the product and forecast higher sales so more stock will be sent to stores. A problem with this type of forecasting is that the planners (and managers) are making a lot of assumptions that if stock is pushed, more sales will occur.

This can have dangerous results as demonstrated in the article “*The 11 Greatest Supply Chain Disasters*” (Supply Chain Digest, 2006).

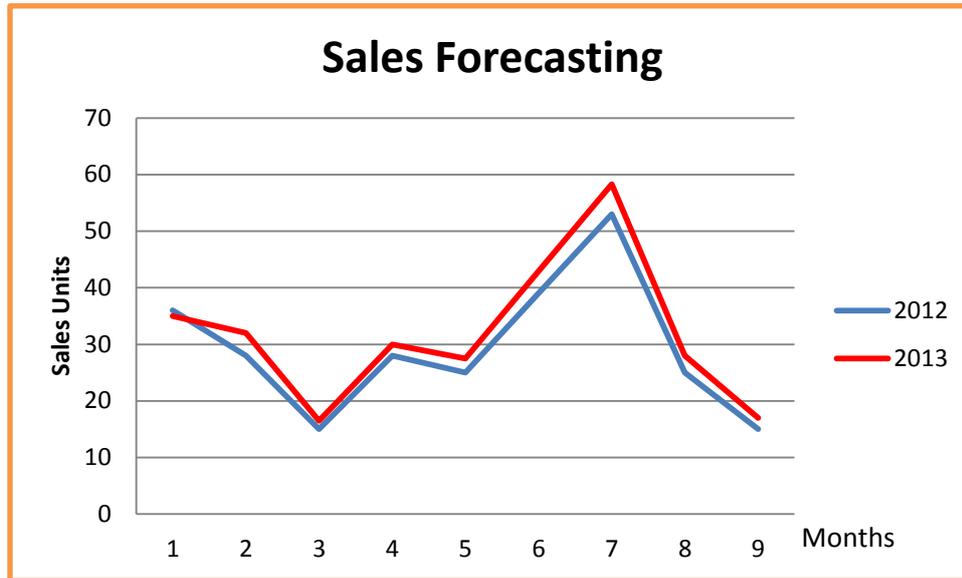


Figure 23: Typical forecasting of a planner

Brand building is often accompanied by factors and assumptions such as:

- Increased sales of a “less” favourable brand
- A new brand being introduced into the company
- Competitive factors from outside the company which switches the sales to a less favourable brand
- If we push the stock, the sales will follow

3.3.2 Planning meeting analysis

Each month, planning meetings are held with the planning executive, executive manager, and category planner and buyer. During these planning meetings planners explain the current performance of a category and what the planner’s expectations are of the category going forward. Main focus areas of these meetings are summarised in Table 16.

The planning executive analyses the planner’s current working plan (WP) and forecasted results for the category and approve the planner’s work; this is referred to as an approved plan (AP). If the executives do not agree with the planner, the planner will need to change the plans, for example forecast lower sales, forecast higher sales, order less or more stock or forecast a higher or lower percentage increase in sales versus last year’s sales. Table 16 summarise the main focal points of the monthly planning meetings. In these meetings,

planners need to discuss the previous months' sales, stock, orders, budget and comment on the future month's plans for each category and department.

Table 16: Main focal point for monthly planning meetings

Main focal point for monthly planning meetings
Current vs. forecast sales for current month
Current vs. forecast stock
Stock coverage
Imports planned for the category (if relevant)
Actual vs. budget sales
Actual vs. previous planning meeting sales, stock, etc.
Year to date sales and stock
Planned closing stock and sales for year end

Figure 24 summarises the results of the retailer's sales achieved for the months March 2013 to December 2013. In this figure it is possible to see last year's sales (LY), what the sales budget was for 2014, what the AP was for 2014 and what all the planners' WPs are. There are notable variances (in some cases significant) between the AP, WP and budget. As observed during these planning meetings, the AP and WP should be the same and no differences should exist.

After planning meetings, planners are expected to change the workings (or keep the workings) to the same as what the planning executive approved: the AP. However, it can be seen in Figure 24 that the AP and WP are almost never the same. This can be a possible problem. Why are the planning meetings held if the planners are not adhering to the planning executives' instructions? The same problem is seen in Figure 25.

In Figure 24 and Figure 25 there are three to four factors present, budget, AP, WP and Actual. As seen, the budget, AP, WP and actual numbers are seldom the same. It is difficult to predict what the actual month end results will be when planning meetings are held. As stated by Capgemini (2009), "The purpose of planning is not to predict the future with prophetic certainty, but to ensure long-term success".

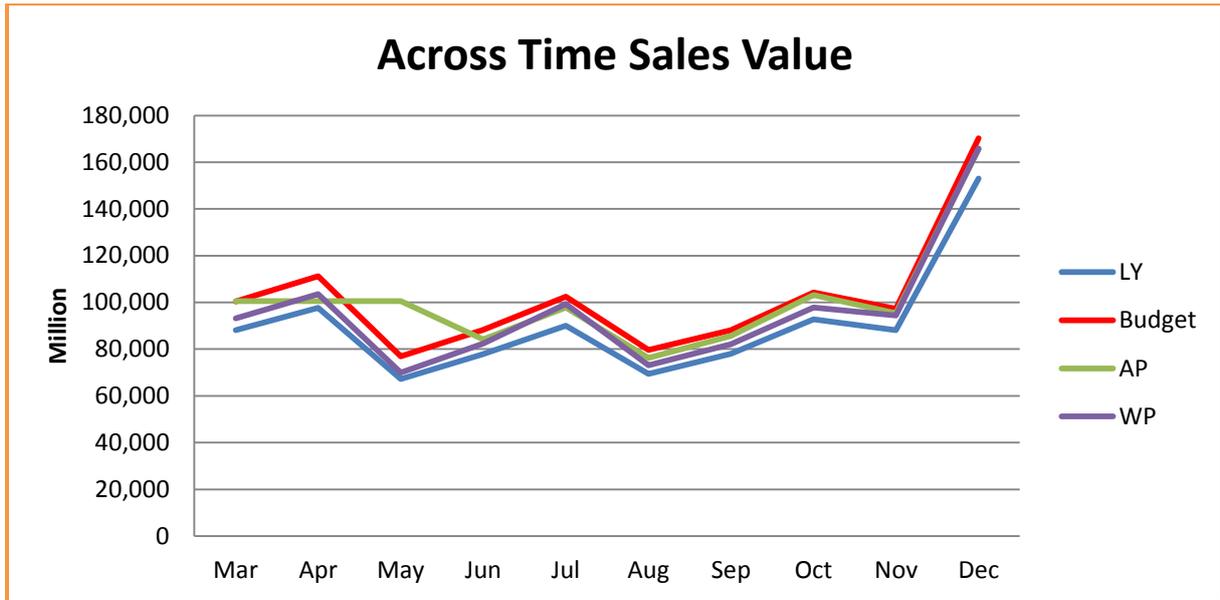


Figure 24: Across time sales value

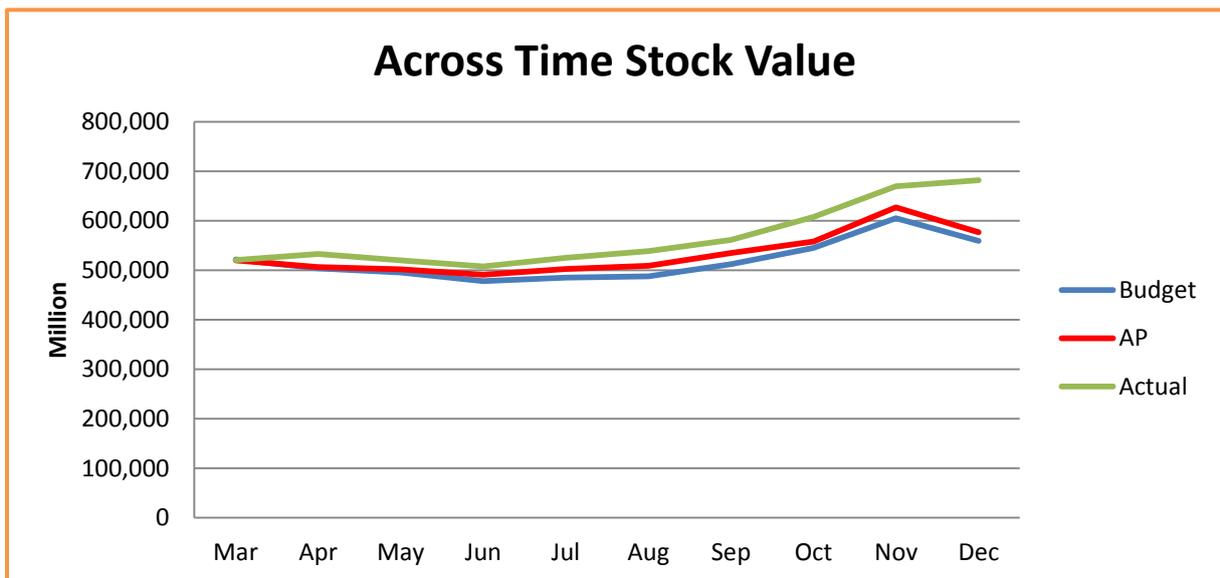


Figure 25: Across time stock value

Planning meetings are held to ensure the long-term success of the company. Where planners cannot predict the future with 100% certainty, it is still expected from the planners to use professional judgement, qualitative data and quantitative data to predict with the most accuracy possible what future results will be achieved. This helps the company to achieve the desired goals and objectives. It also allows the planners to see (and the executives) where possible problems may surface and indicate where goals and objectives may not be achieved. In Figure 26 it can be seen how planners place over and above order volumes to what was actually approved in the planning meetings.

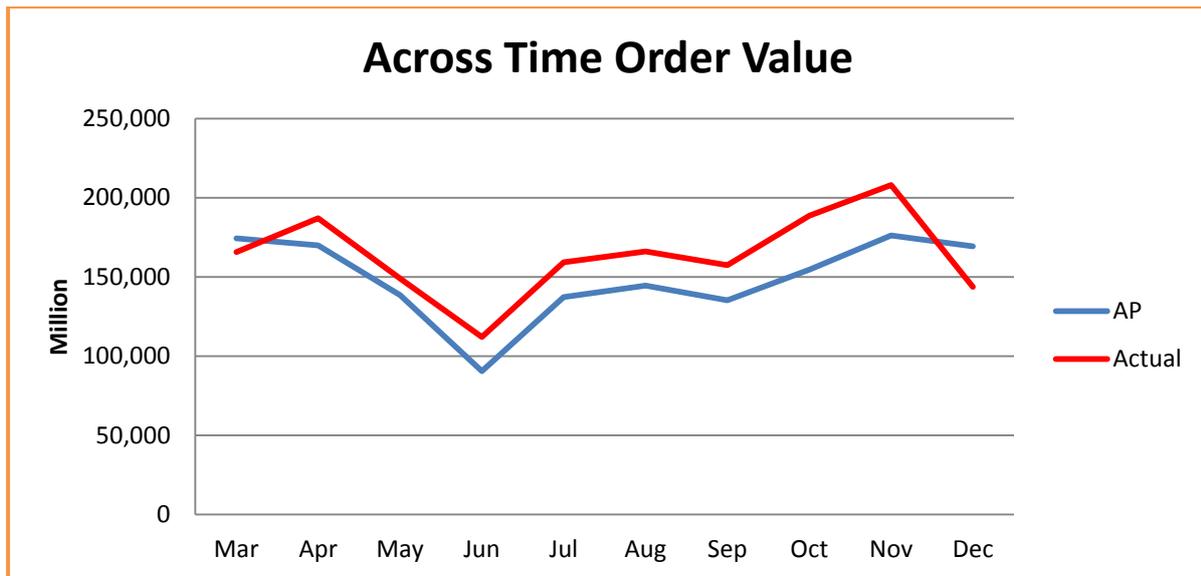


Figure 26: Across time order value

3.3.3 The order replenishment system

The retailer in the case study has numerous types of ordering which takes place in the company. Ordering can take place on a monthly distribution, an ad hoc fill in order, a promotional order or the order can be for a special customer request. There is, however, a set standard, which was set by the planning executive, on how the monthly distribution orders should be placed. Distribution orders as defined by the retailer are the fixed monthly orders which take place every three or four weeks for the next calendar month. For example, in week three in the month of June, distribution orders will begin for the month of July. Distribution orders always take place one month prior to the actual orders that need to be delivered.

Planners are expected to work out the put into stock (PIS) units for the distributors. The distributor then takes those units and puts them into the ordering module in the retailer's Retail Management System (RMS). The ordering module then works out the best quantity, given the PIS units, for each of the thirty five stores. Figure 27, is an example of how this is calculated.

In Table 17, the current stock, minimum display quantities (MDQ), minimum order quantities (MOQ) and sales of four products are shown. Planners need to revise the stock on hand and sales for each import product before import planning can begin. In the example in Table 17, the total sales are shown for the months February to May and February to June. When sales start to exceed the current stock on hand levels in a given month and fall below the MDQ of the product, planners will decide to import the product in that month. For example, the sum of the sales for product A from February to May is 78 units. This leaves the stock on hand at the end of May at 98 units (stock on hand minus total sales). This is below the required MDQ for that specific product and the planner will decide to import the product in May so sales will not be lost in the following months. This is also true for product B, C and D.

To calculate the amount of units for each product that needs to be imported, planners look at the sales following the month in which the import should arrive. Here, planners will forecast the sales following the month of May to see how many imported units should be ordered. For Product A, the sales units following the months of May to January, are 148 units. The MOQ of this product is 100 units, but the MDQ for this product is 175 units. Thus, an imported amount of 200 units is ordered. The same type of planning will be done for each of the products B, C and D.

This type of planning can be very exhausting for the planners. There are departments where one supplier, supplies one hundred different types of products. Individual sales forecasting, and import planning needs to be done for each of the products separately, which takes an enormous amount of time and effort. After the units have been calculated, the Rand amount of the order must be calculated. The overall planning must be taken to the planning executive to revise and approve. When the import arrives at the local warehouse of the retailer, a distribution order must be done on the retailer's ordering system to allocate and send the units to the stores needing stock. Thereafter, monthly distribution orders will be done to replenish the stock in the stores.

3.3.5 Supplier indications

Indications need to be given for certain products that are either high valued, fast sellers or new products that need to be manufactured. This is done to minimise over or understock situations for both the supplier and retailer.

In the case of seasonal products (such as cricket and hockey) suppliers would arrange a meeting with the buyer to show the new range available for the upcoming season. These often

include new styles, colour ways, stickers, shapes, sizes etc. Buyers and planners go view the new products together and the buyer decides what new products will be selected to go into the company's range. Buyers have the key responsibility to source and buy new products, but in some cases the planner is also involved for some input.

When the new range has been approved, planners are requested to provide indications to the suppliers as to how many products, from each style or colour for example, the company will be buying for the new season. For the similar product or products which are replacing old styles, planners will give indications similar to what have been sold in the current or past seasons. For products which are completely different, an estimated qualitative and quantitative guess will be made on how well the product will perform in the company. This is made on professional judgements by the planner, buyer and supplier. Planners will in these cases look at similar price point products which fall into the same category to see how the product fared in the current season. The new product will be given similar sales, but qualitative factors will also play a role such as in Table 18. A planner needs to take into account how the market will react to the new product, past experience will help with this, and must also have reasonable expectations for the sales of the product.

Once the indications have been calculated and reviewed by both buyer and planner, the final indications are sent to the supplier. Suppliers need these indications to know how much stock should be produced or imported. In most cases where international branded products are involved, the products would be imported. For imported products, suppliers need indications at least four to five months before the products need to be shipped.

Table 18: Qualitative factors playing a role in new product indications

Qualitative Factors
Previous experience when new products were introduced
Knowing how the market reacts to new products
If the product will have strong marketing from the suppliers or the company and how product will react in sales
Rational thinking and mentality (based on experience)

Qualitative Factors

Reasonable expectations (based on experience)

3.4 Tracking reports

3.4.1 Tracking of stock and product life cycles

To be overstocked, can have numerous effects on a company's overall strategy. Stock needs to be monitored closely and it is the planner's duty to make sure that stock in the company is healthy (no understock or overstock situations). Internal reports such as the stock status and stock aging reports are updated on a monthly basis to assist planners in this regard (planners can also access stock on hand figures for products or categories on a daily basis). Stock in the company is a valuable KPI to how categories are performing, or if there are any over- or understocked situations that need attention. These reports show the planners how much of the stock is on "normal", "off-range", "distressed" or "mark-down" status.

- **Normal:** Products that are selling well and on-going in the range. Regular orders are placed for normal status products.
- **Off-range:** Products are discontinued and may not have sold well, the suppliers discontinued the product or a new model is coming in.
- **Distressed:** Products did not sell well at all. These products need to be monitored very closely and will not be ordered from again. These products will most likely be discounted and sold on a promotion.
- **Mark-down:** Products that have been off-range previously and are selling at less than the retailed selling price.

The stock status report shows exactly how much stock (measured in net rand and percentage of overall stock) is currently in the company and what the status of the stock is. Planners monitor these reports as stock which is normal and off-ranged is seen as healthy stock, where stock which is on distressed and mark-down is seen as unhealthy stock. Planners need to monitor these statuses of the product and if there is too much unhealthy stock in the company, action steps need to be taken. These steps can be to have an in-store promotion on the stock, competitions, further mark-downs, etc. The action steps need to be thoroughly thought through and ideas need to be presented to the planning executive and merchandise manager. Planners also need to calculate the discount spent on the sales that would likely occur from the promotion.

The stock aging analysis shows how old the stock is in stores and this is measured in months. It can be seen again in percentage net stock, measured in months, how old the stock is. Healthy stock has been in the company for one to four months, where stock that has been in the company for more than four months, needs to be monitored. Planners need to investigate why the stock is selling so slowly and what action steps can be taken to improve the movement of the stock. Some action steps are to see where the stock is, for example what stores are carrying the bulk of the stock. Bulk stock that is being carried in a less desirable store who cannot sell the stock, would need to inter-branch transfer the stock to a store where the stock has been sold out or where the products have been selling reasonably well.

An overstock situation can be avoided if the planners are monitoring these reports and also be on the lookout for products that are selling slowly. Stock statuses need to be monitored so planners can immediately know what products are not selling well. These products should not be ordered again and need to be cleared out of the stores.

3.4.2 Margin tracking

To keep track of the gross sales profit margin in the company, two reports are used regularly to track the results. One of these reports is updated on a weekly basis and the other, on a monthly basis. On the weekly report, planners can see the margin per category and check if the margin is on par with the budget. The monthly report is the end result of all the weekly reports and show what the overall margin was per category for the corresponding month.

It is important for planners in the retail company to track these results, as the margin on the products are directly linked to the profit of the company. This retailer is a highly driven profit margin company. Target budgets are given at the beginning of the year and planners are expected to keep within these targets (margins should not be below the budget). Gross sales margin for the retailer is calculated as shown in Equation 3.1.

$$\text{Gross sales margin \%} = \frac{\text{Retail selling price} - (\text{Cost of product} \times 1.14)}{\text{Retail selling price}}$$

Equation 3.1: Gross Sales Margin %

The cost of the product can either be the initial cost price the suppliers are asking for the product (this is mostly the case when the product is new) or it can be the current cost of the product at store level. This takes into account the warehouse costs (if the product is a warehouse product which the company stocks), transportation costs and any other costs that

might have occurred to get the product into the store. The cost can also be an average cost. In this case, the same product has different cost prices in stores, but the same selling price. This can happen when a supplier increases the cost price of the product, but there are still products in the company at the old cost price. An average cost price is then calculated for these scenarios. When margins fall below budgeted target, planners are faced with two options on how to increase the margin:

- Increase the retail selling price of the product
- Decrease the supplier cost (the assumption is made that planners cannot decrease warehouse costs, transportation costs or any other costs that are outside of the planner's scope)

An increase of the retail selling price will have an increased effect on the margin, but it also means that the customer is the one who needs to carry the increase. It is sometimes an easier method for planners to increase the retail selling price than to decrease the cost price of the product which the supplier charges for the product. This means planners (or buyers) need to renegotiate the cost price of the product.

This is not always an easier way to go as suppliers are reluctant to decrease the cost price of the product, as it will have a direct impact on the suppliers profit. Planners or buyers can try to negotiate a bulk sale discount from the supplier which can also decrease the cost of the product for that once-off buy; this will also lead to an increased margin.

The margin for the retailer in the year of 2013 is shown in Figure 28. It is graphed on what the budget margin was and the actual margin that was achieved. The margin showing in Figure 28 shows the gross sales margin achieved for March 2013 to December 2013.

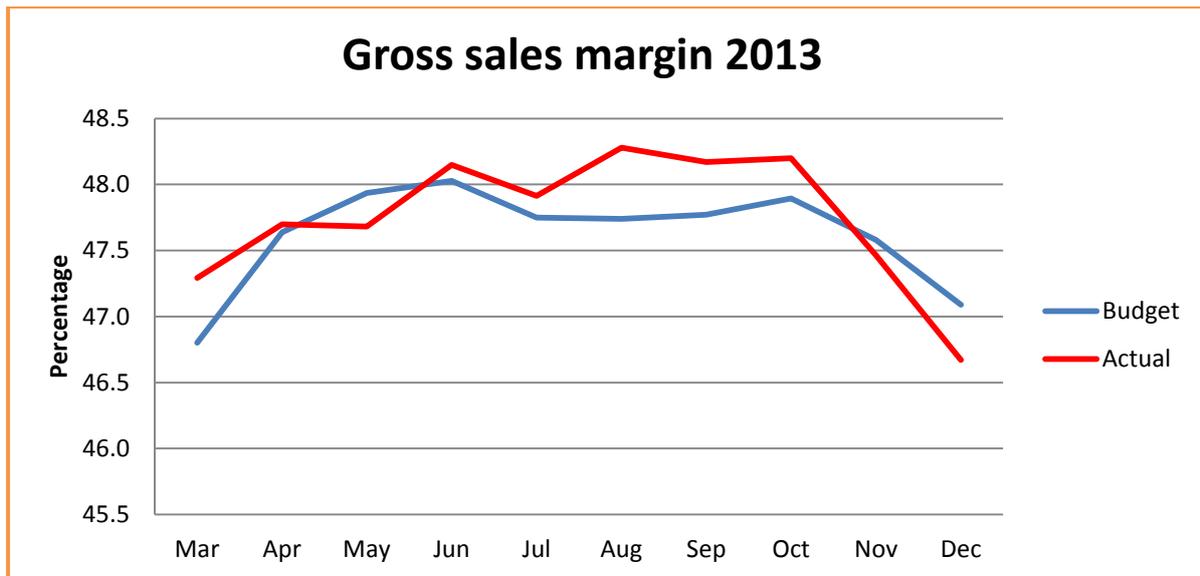


Figure 28: Gross sales margin 2013

The graph shows that although a budget was given for the gross sales margin that should be achieved, there are some cases where the budget was not achieved and vice versa. In most cases, the gross sales margin was more than the set out budget. It is not always possible to achieve what has been set out in the budget. Margins may fall behind due to factors such as:

- Higher import cost rate
- Exchange rates
- Inflation
- Competitiveness
- Market trends
- Recommended retail selling prices
- Cyclical factors

As discussed with the planners, and as observed during the case study, the factors which influence the margin are not always in a controlled environment. Planners may plan months in advance for imports at a certain rand to dollar price, but when the cost of the imports change due to higher exchange rates, the trade-off should be made, lower the margin on the products so the consumers still pay the same retail selling price, or increase the margin and pass the rand to dollar exchange rate difference on to the consumer. At this point when the products have already landed in the harbour, the cost price of the products can no longer be negotiated with the supplier as the pro-forma invoice has been signed and agreed upon months in advance by both the exporter and importer party.

In other cases, products have to trade under low margins, because if the margin should increase for that product, the product would no longer be at a competitive price against other retailers. This is also the case with market trends. If the trend of the product is to sell at a lower price and if the product is very price sensitive to higher prices, then the margin of the product would also have to lower (these cases assume the cost price of the product is fixed and cannot be negotiated with the supplier).

The situation may also be that the products have a recommended retail selling price (RRS) which is given to all the retailers from the suppliers. Going above this recommended retail selling price would also decrease the competitiveness of the product as most retailers would try to keep in the range of the RRS. There may have been some speculation that recommended retail selling prices are very much like price fixing as the retailers know that once the price goes above the recommended RRS, the product will no longer sell. This is at most only a speculation.

3.4.3 Sales and product tracking

There are numerous ways to track the sales in the company, but the most common way observed for planners to track sales, is with a pre-set up report in Microsoft Excel. This report shows month to date sales, total daily sales as of the previous day (current daily sales cannot be shown in the report), historical sales of the month, minimum display quantities of the products, products on order, products on commitments, etc. Real time sales for products can be accessed directly on the retailer's retail management system.

Planners in the company can use this report on a daily basis to track and plan for forecasting, to plan imports, to plan for upcoming promotions or price changes and the report can also be used to track the gross sales margin per product or per category. Planners need to update this report on a daily basis so recent sales and data will pull through from the previous day. Each planner has their own sales report and the report can be divided into different departments or categories. This report can only be updated once a day as the server which the data is pulled from updates each night at midnight. Once the report has been updated, the latest data will show and planners can easily plan or update any changes that need to take effect. Important factors that need to be focused on when working in this report:

- Sales per product
- Margin per product
- Stock on order

- Stock on commitment
- Stock on hand per product
- Sales history
- Inter-branch transfers
- Stock received (from both the warehouse and suppliers)
- Sales projections
- Target stock cover for the stores
- Rand amount spent on orders
- Minimum display quantities per product

Each of these factors plays an important role in the planning process of this report. If a product is under-selling or over-selling, the planner needs to adjust the forecast so the forecast will not be an over- or under-estimated number. The effects of over- or under sales predictions for stock are shown in Table 19.

Table 19: The effects of over- or under-forecasting

	Over predictions	Under predictions
Effects	Over supply of stock ordered	Under supply of stock ordered
	Over estimate of gross sales	Under estimate of gross sales
	Over supply of stock in stores	Under supply stock in stores
	May lead to increased sales	Loss of sales
	Increased carrying cost	May result in lower carrying cost
	Decreases the spending budget	Increases the spending budget

Sales need to be continuously monitored and adjusted so effects in Table 19 can be avoided or controlled. If there is stock on a commitment for stock that has a low selling rate those commitments need to be cancelled or adjusted. It is not the best option to cancel commitments from suppliers (both for the company and the supplier). Commitments are given to a supplier to ‘commit’ to a certain quantity of product. Suppliers base their own orders and indications on what commitments they receive from retailers, but it is not always

possible to take up a full commitment or even half of the commitment from a supplier. Yes, the company committed to the stock, but if the sales do not justify the commitment it is very difficult for the company to take on the stock which will not sell. If the commitment is taken, the stock will only lead to over-predicting effects mentioned in Table 19. Another effect is also possible namely, underprediction. If the planner underpredicted the sales of a product and thus under committed the units, the supplier may not be able to supply more than what the company committed to. This may then lead to the effects of under-predictions in Table 19.

The relationships which the planner or company builds with the supplier can in these instances play an important role. If a good relationship exists the supplier will in most cases try to help the company when there was an under- or overprediction, but both of these cases are at the expense of the supplier. The supplier will most likely carry the costs of an over- or under-prediction in terms of a commitment. If the company does not take up a commitment, the supplier is left with the stock which the company did not take. The supplier is then left with the effects described in Table 19.

3.4.4 Key performance indicators

KPIs that are recommended to be tracked by Harwell (2006:9) and the Parker Avery Group, (2013:2) are summarised in Table 20. These KPIs were calculated for a six months period from March 2013 to August 2013. These are the first six months for the company's 2014 financial year and can provide the relevant insights to how the KPIs are performing. It is then possible to take the necessary actions when KPIs are under performing.

GPROS would differ from store to store. For the company the GPROS are in some cases limited to the space available in the total store and cannot always be utilised, because the stock which provides the most sales are allocated the most space. As far as possible, the company allocates more space to the departments which provide the most profit. No official internal reports are generated on GPROS, but managers do look at the amount of allocated space per department. It would be insufficient for the company to allocate large amounts of floor space to departments which have a low profit rate. Certain specific departments are given more floor space based on the profits the departments are making and this decision is a qualitative decision based on the quantitative results of past sales.

Table 20: Summary of KPI's

Key performance indicators
GPROI
GPROS
SSR
ST
Turn
Basic Stock

Table 21: Key performance indicators results for 6 months

	KPI	Result
1	SSR	0.97
2	ST	1.03
3	Turn	1.03
4	Basic Stock	5.81

Table 21, shows the result that could be calculated from the reports access was gained to. The SSR refers to the rate at which stock turns in the company. In this calculation, it can be seen that 0.96 (96%) of stock for the next six months' sales is already part of the company's stock. For the months March until August, there is already sufficient stock to carry and provide for the next six months. This ratio might look unnaturally high, but when looking at the sell through percentage, 1.04 (104%), the sell through of the stock is more than 100%. This is healthy and means all the stock on average is sold out within six months. This can be compared to the stock turn which is 1.03 and is turning around once every six months. It may be assumed that for twelve months, the stock turn will be 2.0, which can mean that the stock is turning twice a year. The basic stock for the company, based on a six month average, is 5.81. When interpreted, the company should carry at any given point in time five months' worth of stock to carry the forward predicted sales that might occur in the following six months. It can be commented that five months stock is a large amount of stock to carry, but the sales justify the amount of stock being carried compared to the amount of sales which is reached.

3.4.5 Graphical tracking

The planners in the company use little or no form of graphical displaying of information. As mentioned by Brooks (2009), displaying data in a graphical format allows the user to obtain more insight into the data and notice relationships in the data which otherwise would have

gone unnoticed. Using the data obtained from the company's sales reports, it was possible to display the data in a more graphical form. Immediately, trends in the data could be spotted. Figure 30 is an example from the company on a product which can be used in a time series forecast when using quantitative methods.

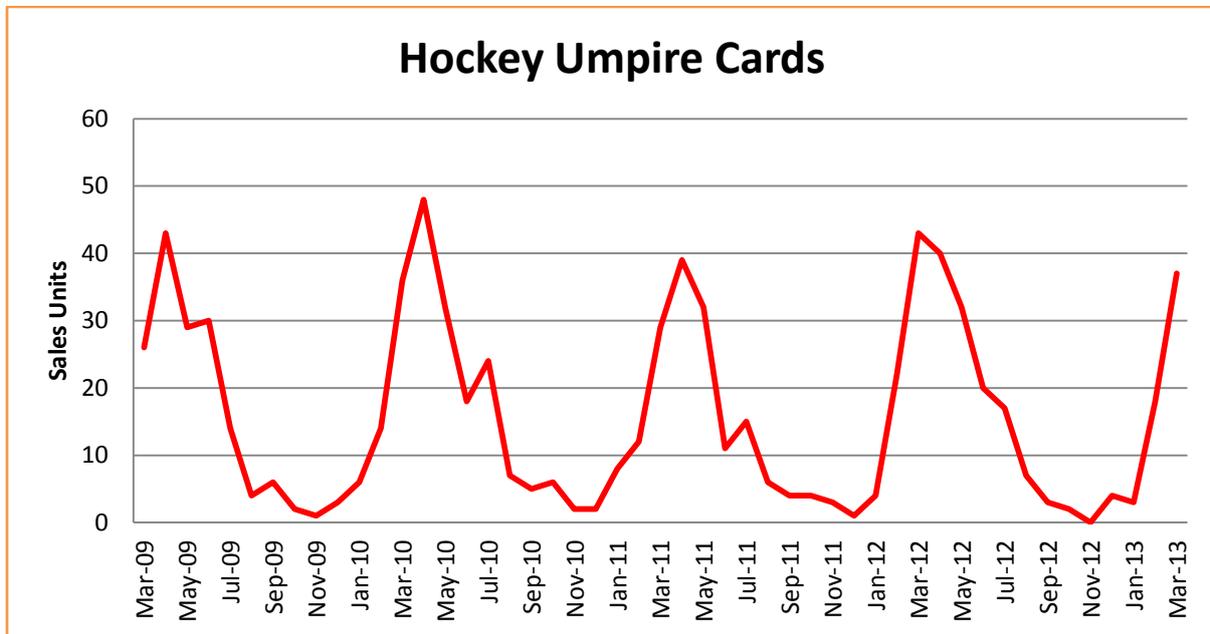


Figure 29: Graphical display of trend data

In Figure 30 it can be seen that there is a trend in the increase of units sold each year for this specific children's bicycle. A trend line shows the increase of units sold per year. In Figure 29 the data clearly shows that there is a seasonal trend in the selling of hockey umpire cards. A rise in sales can clearly be seen each year in March. This can be used in predicting and forecasting future trends and an assumption can be made that for the following year the month of March will show an increase in sales again.

When hockey is in season, the units of the shin guards seem to be selling fairly well (Figure 31, March to June). In the off seasons, the shin guards sell very little units (September to November). This pattern is repeated year after year and it can lead to a fair conclusion that hockey shin guards fall into the category where units sold have a seasonal pattern. These types of displaying of data can be used in numerous of the reports the planners currently use to make the data easier to read and to spot the underlying trends in the data.

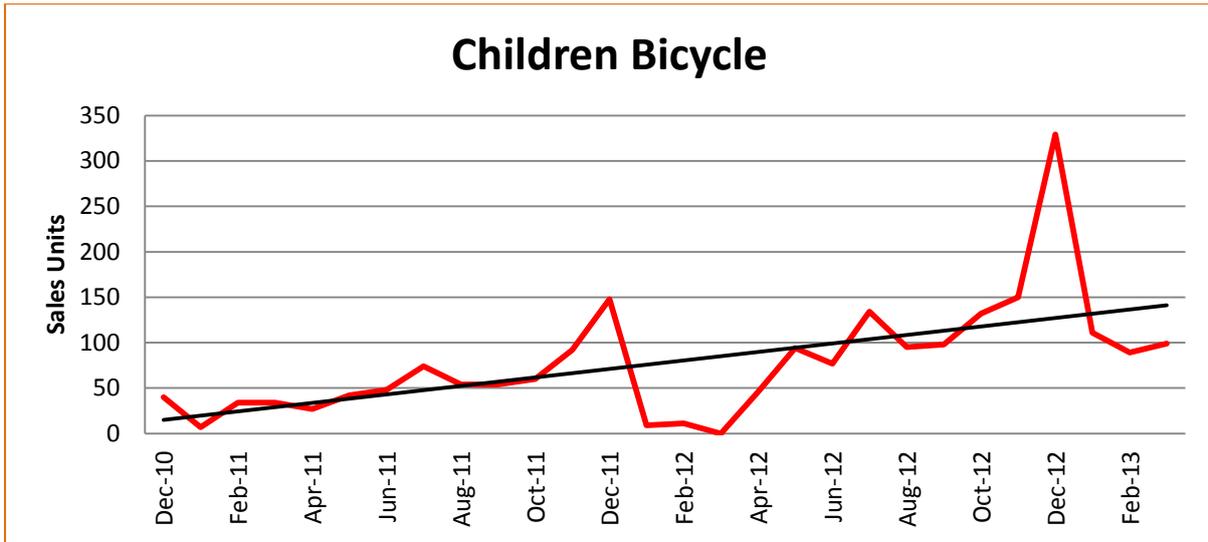


Figure 30: Graphical display of a trend line

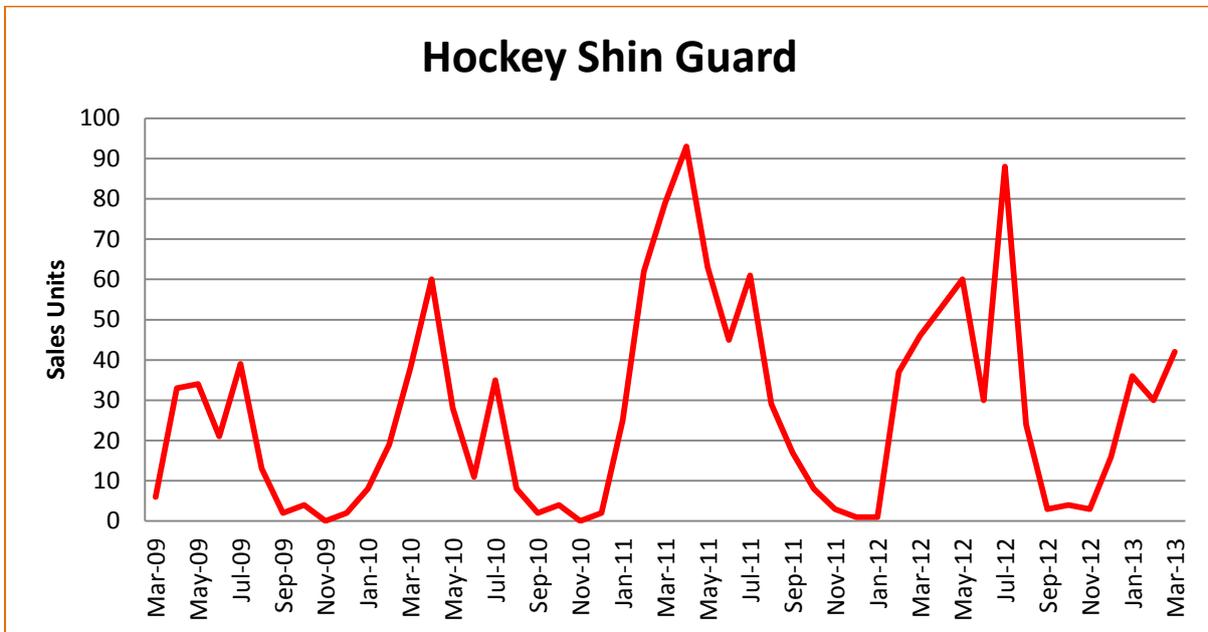


Figure 31: Graphical display of a seasonal pattern

3.5 Stock planning

3.5.1 Planning for stock

As much as planners need to plan for demand, planning must also be done on what stock levels should be kept. At the beginning of each calendar year, planners need to plan what stock levels need to be held in order to uphold the predictions in sales that are going to occur. The initial step that planners take to plan for stock levels is to look at what closing levels of stock was achieved each month of the previous year. Were the stock levels too high? Were the stock levels too low? Did the company lose sales with too low stock levels? Can more

stock be put into the company? What were the forward sales covers for the following months? These are all questions planners are faced with.

The planners look at the covers that were achieved each month in the previous year. The covers refer to the months of stock that was left in the company at the end of a month. Future sales are taken into account to calculate the forward sales covers for the company for each product category. To work out the covers, a formula is used where the next months' net sales (Nsls) are taken into account and the current stock on hand (gross stock) for the predicted closing stock on hand (CSOH) for the current month. The closing stock takes into account the store stock as well as any warehouse closing stock (WCSOH) should the product be an imported one.

$$\text{Stock cover} = \frac{(\text{CSOH} + \text{WCSOH})}{\text{Nsls for next month}}$$

Equation 3.2: Stock cover

The cover amount equals the amount of months that stock will last, given the future sales that the category will achieve. For example, if the cover is 3.0 this tells the planner that for the next month, the stock in the company would have lasted for another three months based on the sales of that next reoccurring month. Stock covers for the retailer always take into account the closing stock for a month and the sales forecasts for the upcoming month. Each planner has a minimum set of cover months for a specific department. The planning executive will give the planners an indication if the month of cover is too high or too low. Planners set up budgeted stock before each financial year which is evaluated in budget meetings. The stock budget is then approved by senior management.

Planners have an initial indication as to how much stock needs to be planned for by looking at the stock levels from the previous year and making an informative decision if those stock levels were effective for the company. When the stock budget is set up, a budget meeting with the planner will be held where the planning executive will comment on the stock levels the planner has planned. During the course of the year, the planners will refer to these budgeted stock covers and will immediately know when the stock is over the covered budget. Naturally in order to pull back stock, less stock needs to be put in if the planners have an overstock situation. Overstock situations often occur if a category is experiencing a drop in sales, which leads to more stock for that specific category which may also lead to overstock

situations for the company. Other overstock situations can also occur due to an over estimation of sales for a category or product.

3.5.2 Minimum displayed quantities

Each product which is displayed on the floor of a store has a set minimum displayed quantity (MDQ). The MDQ's of a product is decided by the buyer and the planner. These MDQ's are important as it directly affects the products' visual display to the customer and can be directly linked to the sales of the product. A high selling product with a high clearance rate will in most cases have a high MDQ so products are always on the floor, prominently displayed, and always in stock. MDQ's for the same product can differ from store to store according to the demographic aspect, the location of the store, the size of the store and the sales history for products in the store.

Naturally there are cost implications to keeping high MDQ levels. High MDQ levels affect the cost of keeping stock throughout the company. Planners should take this into account as a high MDQ will inflate the order quantity of a product. The higher the overall MDQ quantity for a product (sum of MDQ for all the stores multiplied by the number of stores) the higher amount of product needs to be ordered to keep the MDQ levels for all the stores in line. MDQ's of the products should be a strategic decision based on the sell through rate of the product for each store and in some cases, the size of the product. Large items which take up a lot of space can have a lower MDQ, but this is also affected by the amount of available space on the retailer's floor.

3.5.3 The apple-theory

During a conversation with the executive manager, the manager commented that keeping stock levels at stores efficient and effective is not always such an easy task. Obstacles occur from a consumer's and retailer's perspective.

The manager used a simple example of selling apples at a grocery store to explain the situation. A customer who wants to buy apples walks into a grocery store and heads for the fruit and vegetable aisle. When getting there, he sees that there are only two apples left. He decides not to buy the apples, because of a few possible reasons, the other apples are sold out so these last two apples are probably not fresh anymore, the last two apples do not appear visually attractive to him so he goes home and does not buy any apples. The next day he returns and finds the apple basket full of green apples. He immediately buys two apples and goes home. Perhaps he just bought the same two apples he did not want to buy yesterday?

Planners and buyers need to uphold the relationships with between the suppliers and benefits should be presented from both parties. Suppliers often depend on the company to help clear out their extra stock. In most cases, these types of excess stock can include old seasonal stock. This stock needs to be cleared before the new season's stock arrives. The company would work on buying the stock at a special discounted price from the supplier. The company will collaborate with the supplier to run a promotion on the excess stock. Here it would be a win-win situation. The company will make extra sales and profit on the stock and the supplier will clear the excess stock. The supplier would have to compromise on the selling margin to the company, but for the supplier it may be a small trade-off in order to be able to clear out old stock.

In some instances the company cannot take on the stock as it might be products that had a bad performing sales history. If this is the case the company would not buy into the excess stock from the supplier and the supplier would have to find other means to clear out the stock. It is the duty of the planner and the buyer to uphold good relationships with the suppliers. Good collaborative relationships provide benefits to both parties so that a win-win situation can exist. Alliance relationships are not very common in the company. It might be due to the fact that many of the company's main suppliers also supply the competitors in the market and therefore forging an alliance relationship would be difficult for both parties.

3.7 Planning phases

Planning can take place in certain time fences. Planners in the company need to plan in all of the three fences. There are short-term frozen periods where the demand is driving the stock that needs to be sent to stores, but there are also intermediate planning horizons where the planners need to plan for slushy types of events. These might include short-term planning for commitments that need to be done for suppliers as well as long-term planning which falls into the fluid planning period. These types of fluid planning are normally done for new ranges that are coming in over the next six months from suppliers or, for even longer-term planning, orders that need to be given to overseas suppliers that need to start production on certain items. The planning horizons of the company are expressed in Figure 33.

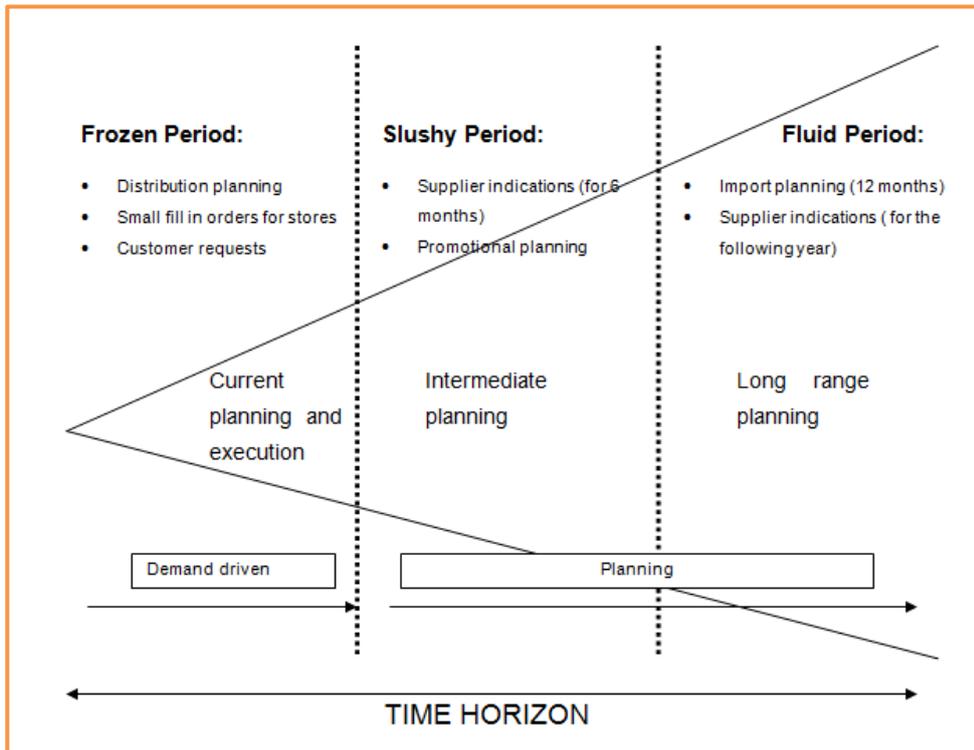


Figure 33: Planning phases of the case study (figure adapted from Burt *et al.*, 2010:53)

3.8 Interviews: Planners

Interviews were conducted with eight planners from different departments to discuss methods of forecasting, stockholding and planning. All the planners from all the departments seem to be using the same forecasting methods as discussed in Section 3.3. Methods for forecasting also include, looking at current trends in the market, investigating past sales of the same product, individual store performance on products, future promotions to be conducted and also previous years' promotions which might have taken place. According to the majority of the planners, qualitative information can also play a key role in how to predict future sales. Planners who have worked in the same department for more than one year can easily make use of qualitative information as these planners remember events or certain conditions which took place in the company the previous years. Events or conditions might include suppliers who ran out of stock of certain products. This can be the reason why sales were so low for a specific product. Planners who have only worked in a department for a year or less did not rely on qualitative information as their experience with the products and events that might have taken place were not as broad. These planners were relying on more quantitative data to do the forecasting. When asked if the planners think the methods which are being used for forecasting were effective and efficient, most of the planners agreed.

Planners were also asked during the interviews if there might be better or other methods of forecasting available. Four of the planners denied this, two planners were not certain of what other methods are available in the retail industry and the remaining two planners replied with a definite answer that there might be other more effective methods that can be used which are less time-consuming than the methods the planners are currently using.

Planners were also asked to elaborate on stock management. Stock management for most planners consisted of making sure the demands are met (looking at historical data to forecast stock needs), the products must make a statement in the stores, and looking at individual store performance so stores will not be over- or understock. All the planners also make use of spread sheets in Microsoft Excel which are updated daily with the previous sales' data to see where stock might be too low or too high on a product level as well as on a store level. The planning executive commented, in regards to stock-keeping in stores, that stores should take more initiative in terms of their own stockholding. If stores see stock of a certain item is too high or too low, the store must take on the responsibility of transferring the stock to a nearby store which has the space and the sales to take on the extra stock. Most planners agreed that there might be more effective ways of managing stock which are not as time-consuming as current methods, i.e. manually checking the stock per store and per product. Manually refers to using pivot tables to extract and to calculate the stock per store or per product or checking the real-time stock of a product or stock per store on the RMS.

During the interviews it was observed that most planners feel that all the methods and techniques being used for forecasting and stockholding are effective to reach the end goals which are, no out of stock situations and accurate sales forecasting. Planners feel that one aspect which might have the opportunity to improve upon is the time constraint it takes for the detailed planning of sales and stockholding per category and per product. As the methods are effective, planners would like to see a more efficient way of planning stock and sales as some planners commented it takes too long for effective planning to be efficient. The cause of this time constraint might be the fact that the planners feel certain departments are under staffed and therefore take a great deal of time when distributors are absent from work. It came across that the planners feel frustrated when distributors are absent from work and that the distributor's work falls on the planners' shoulders to complete when the distributors are absent. Certain planners felt that there are too few distributors in specific departments.

The key role of distributors in this retailer is to assist planners in the placing of monthly orders, handling store and customer queries, updating Excel spreadsheets which are used by



Table 23: Summary of hygiene and motivators factors

Hygiene Factors	Motivators
Company policy and administration	Achievement
Supervision	Recognition
Relationship with supervisor	Work itself
Work conditions	Responsibility
Salary	Advancement
Relationship with peers	Growth
Personal life	
Relationship with sub-ordinates	
Status	
Security	

Factors which achieved a high score of dissatisfaction included working conditions and salaries. In the open-ended questions, many employees commented that the work environment, such as proper ventilation in the offices, is a disconcerting factor. Employees wanted to have more ‘fresh air’ in the offices and commented that there was no place allocated to eat lunch (such as a cafeteria) except in front of the computer. ‘Flexi time’ was also a factor which was mentioned a lot. Table 24, summarises the answers given by employees when the question, “What suggestions do you have to improve employee satisfaction in the workplace?” was asked.

Table 24: Employees' recommendations

Employees' recommendations
Flexi time
Lunch area
Proper ventilation
Recognition for overtime
Rewards for overtime

Employees' recommendations
Market related salaries
More employees to be employed
Decreased work load
Positive feedback from supervisors

Out of the buyers and planners, 44% answered the open-ended questions that 'flexitime' is a prominent factor. Overall it may seem that all the distributors have employee satisfaction. When distributors were asked in the questionnaire to comment on what suggestions there might be to increase employee satisfaction 33% of the distributors commented that there is no equality between employees and that distributors are not treated fairly or as equals. This could be a hygiene factor which may lead to more dissatisfaction under distributors.

It must be mentioned that the employee turnover rate for this company was extremely high in the periods June 2013 – June 2014. During this time period, more than half (54%) of the staff resigned (this number is only applicable to the total planners, distributors and buyers of the company). The most popular reasons for employees leaving the company were better work opportunities that were presented to the employees at other companies. This included better salaries, employee benefits and working hours.

3.10 Supply chain disruptions

As seen in the article "The 11 Greatest Supply Chain Disasters" (Supply Chain Digest, 2006), planning is not always executed in the best way. It was observed that unfortunate results can occur when planning is done in a rushed environment or not given the appropriate time and effort for thorough planning to take place.

During the time of the case study some of these observations stemmed from negligence, incorrect forecasting, incorrect market analysis and over expectations of category performance. Negligence did not play a very big role in planning mistakes, but in one case a planner imported the wrong product (where the wrong product description was used for an overseas supplier) and 'dead' stock was imported. This immediately had to be placed on discount to clear out the excess overstock products. This resulted in over expenditure of the budget discount that was budgeted at the beginning of the year. Another case which was observed was the import of a new product range and the expectation that the product will sell well. Unfortunately the customers' reaction to this product was not positive and only when

the product range was placed on discount, did some of the products in range start selling. There are still large amounts of stock with a high total stock value and high carrying costs sitting in the warehouse and cannot be sent to stores as the products will not sell. The results of this instance was also to spend large amounts of unbudgeted discount money, but even after the discounts were placed on the products the company is left with stock which will not sell. Here it can be recommended that a new distribution channel should be used to try to clear out the stock to a different supplier or another large retailer which will take over the stock. The problem can also be with the packaging which does not come across as very attractive, but the costs should be weighed on either distributing the product to another supplier or selling the product to a retailer at a lower cost or spending the money to change the design and packaging of the product.

There were many cases where over-predictions of the sell through rate of the product resulted in ordering too much of the product in order to build the correct stock levels to support future sales. In cases where the products do not perform as planned actions that are taken can either be to discount the product to sell out faster, not ordering from the product again so it will sell over an undetermined period of time or to advertise the product to raise awareness to the customers which can hopefully result in an increase in sales.

The results of all of these unfortunate planning scenarios must be taken into account as all of the above scenarios resulted in either over expenditure in the discount budget and, or unnaturally high levels of stock and loss in the overall budget.

3.11 Current state versus future state

Using data collected during the period January 2013 to December 2013, results were interpreted as to how the company goals measure against what was actually achieved. The goals can be measured by comparing the actual data results versus the budget of the company. The scores of the current versus future state percentages and what was achieved were calculated by using the actual results achieved by the company over the period of twelve months versus what the budget was for each of those months. If the company scored a 100% or above a 100%, this means the budget target was reached, or the company over performed on budget expectations. An average was derived on what was achieved over the twelve months for the variables. For the stock levels, the stock was over budget, receiving an average score of 108%, 8% over budgeted stock. This means that the stock was 92% (100%-8%), under target budget goals.

customer or higher sales were not that present. As the inflation grows, so did the prices of products and the net result is thus only a 1.3% actual increase of sales (Amadeo, 2014, Wijesekera, 2014 & McBride, 2014). Thus, the budgeted sales growth of 13% seemed very unrealistic for this company to achieve. Higher sales predictions led to unrealistically large orders placed to prepare for the sales, which unfortunately did not occur.

The budgeted gross sales margin for the company seemed to be right on par to with what needed to be achieved. The company's policy, as quoted by the executive manager, 'is a high margin business' and thus the company's main focus is to drive a high gross sales margin on 'high quality products'. Bass (2014) mentions in his article "*Low-Margin Business vs. High Margin Business*" that a company which focuses on high margin sales often do not rely on large sales volumes. The case study retailer however is relying on high sales margins and high sales volumes. The retailer should therefore take more factors (such as inflation and price increases) into account when budgeting sales growth, as the 13% growth was too optimistic compared to what was achieved in previous years.

When looking at the variables of accurate demand and accurate sales forecasting, we are brought back to the sales and stock situation discussed earlier. The company over-predicted the demand and sales, thereby underperforming on the net sales budget and leaving the company with overstock situations. Lastly, it seemed that the company got the promotional planning correct. Where there were some items which were under-predicted that led to higher discount amounts, the overall goals of the promotional sales were achieved in that the promotions was effective and reached targeted sales set out or stock clearing out.

Chapter 4 Consolidated results and interpretations

In the final chapter, conclusions are drawn and comments and recommendations are given based on the findings and analysis in chapter three. Meaningful insight was given in chapter three and chapter four will give further recommendations to the company.

4.1 Sales and operations planning

The sales and operations meetings taking place in the company have all the relevant tactical processes of bringing the planning processes and activities together to reach company end goals and objectives. The meetings are effective, but can be more efficient.

All of the categories are not reviewed during these meetings and there are some cases where a full year has gone by without categories being analysed in the strategic S&OP meetings. It is proposed that a specific timeslot should be allocated for each department so all departments will receive the relevant attention needed.

S&OP meetings should perhaps focus on the five-step process recommended by Bower (2005:4). These include, the product life cycles, demand and supply plans, reconciliation of the plans and finally senior management reviews. This can be done for all departments and categories within a department. Meetings should also focus on critical resources such as time, money, people, capacity and materials (Hitachi, 2007). It can also be recommended that more focus should be placed on the KPIs that should be tracked in the company. Management must be alert so as not to fall into the S&OP pitfalls that can occur in S&OP meetings. Planners should track KPIs in the company and comment on the performance measurements of the KPIs. Again, as discussed, emphasis should be placed on the reliability of the suppliers. It was observed what the effects of an unreliable supplier may be and these missed opportunities need to be taken more seriously. Discussions with suppliers should be more frequent and action plans need to be put into place on what should be done when suppliers cannot deliver or when a delivery is late. A similar “Tesco” approach towards suppliers to help suppliers improve on current performance is recommended.

4.2 Promotions

Promotions in the company run on a frequent basis. There are months where numerous promotions are running and in some cases, it was observed that promotions overlapped with each other. Therefore, promotions should not be the only way to clear out ‘dead’ or ‘unhealthy’ stock in the company. To save on the amount spent by discounting products, the

company can focus on finding new target markets for the products or new distribution channels for the products. Another option is for the supplier to alter the product such as trying new product packaging which will provide the product with a 'fresh' look which will attract new customers.

New distribution channels can be recommended for products which do not sell or for old stock in the company. It was observed that there are very little opportunities taken to clear out stock in the company. The main focus is still being placed on promotions or trying to send stock back to suppliers.

4.3 Demand planning and replenishment

4.3.1 Forecasting

Planners in the company seem to feel comfortable with the current methods used. Both quantitative and qualitative factors seem to have important roles in the planning for demand and forecasting, but more weight seems to be placed on qualitative factors when planning and forecasting by planners who have been in a department for more than a year.

Planners who have been working longer in the company feel comfortable projecting future demand and sales based on previous experiences, where new planners put more weight on forecasting with quantitative factors. It came across that both methods are effective, but that in seasonal categories previous experiences are very important. If a planner was not involved in the previous season's sales forecasting or demand planning it was difficult to spot trends or to know how products would react in the upcoming season. Knowledge and experience play a very important role in the planners' daily forecasting and demand planning. If the products are not understood or knowledge of the products does not exist, it is a challenging task for planners to do accurate planning.

None of the planners made use of any visual or graphical displays of data to see if any underlying trends existed. Previous sales histories were looked at from a quantitative perspective. Graphical displays of data can be an advantage when trying to pin-point trends. Graphical displays of data should be used in terms of demand planning, so underlying trends can be seen and planned for when forecasting.

In terms of quantitative forecasting, it can be recommended that exploratory forecasting must play a role in forecasting. Planners did not seem to take economic factors into account when forecasting sales. It was experienced that certain categories might have been underperforming

due to economic conditions such as higher interest rates, cost of living increases and uncertain economic conditions which lead to lower consumer expenditure. During the interviews with the planners, planners showed no knowledge of other forecasting methods that could be used. It can therefore be recommended that new forecasting methods that can assist planners with forecasting be explored. Planners all seemed keen to be sent on a course that would improve their forecasting capabilities.

Planners commented that the warehouse import planning takes up a lot of time and to forecast the sales for each individual item individually can be time consuming. It can be proposed that a system such as materials requirement planning (MRP) or demand driven materials requirement planning (DDMRP) can be used to aid the planners in these types of ordering.

4.3.2 Planning meetings

Planning meetings are very effective in the company. It was observed that these in-depth meetings provide the executive managers with meaningful insight to each of the planners' departments. All the relevant topics such as stock, sales, demand planning and forecasting are discussed. Planners comment on how the departments are performing, the success of promotions and any relevant concerns that need to be discussed.

Current and future goals and objectives are discussed in the meetings as well as the likelihood that the goals will be achieved. If it seems that goals and objectives will not be met action plans are discussed or future predictions are adjusted. One recommendation which can be made is to have more strict measures in place when planners do not adhere to the planning executives' approved plans. As seen in Section 3.3.2, there are some instances at the end of the month where planners did not keep to the approved planned numbers. This may be due to numerous reasons, but a meeting should be held at the end of each month so these changes can be discussed, documented and commented on.

4.3.3 The ordering system

The RMS is very effective in achieving the operational tasks of the company. The system is effective in the placing of orders, pulling reports and measuring key indicators of the company. It can be proposed that another system should be used which has a dashboard interface so data can be pulled more quickly and decisions can be made more effectively. An example of a data visualisation system that can be used is Tableau.

These types of systems can easily access the data available and transfer it into valuable information such as representing the data in a graphical format. The time the planners take to

set new reports to evaluate data, is time which could be spent evaluating what Tableau would have already made available with the click of a mouse.

It could be advised to use more efficient means to gather valuable data. The current reporting system works effectively, but is not at its most efficient level and setting up new reports is a timely process. Information cannot be displayed in any graphical form via the RMS or the pivot system. Programs such as Tableau can indicate important trends in a graphical manner, which may, in some cases, be very valuable to a planner who is in a department where trends in the data can be interpreted as valuable information.

4.3.4 Supplier indications and relations

Supplier indications proved to be very important for this company. Within the year of this study it was observed how numerous ordering indications were given to suppliers. Suppliers rely heavily on the indications of the planners more so in cases where suppliers need to produce and import products from foreign countries. Suppliers use these indications for their own demand planning and orders they need to provide to the manufacturers not situated within South Africa. There were also cases where suppliers produce the products locally and need to plan how much products should be produced. A recommendation can be made in terms of communicating these indications to suppliers on a more frequent basis. Where suppliers cannot deliver the indications given by the planners supplier action plans also need to be put into place.

It was also observed how important supplier relationships can be. It was seen how good suppliers' relationships such as transactional, collaborative and alliance, can play an important role in the company. Trust between supplier and company is very important and lead to advantages such as better prices, more insight into future trends and exclusivity of products.

4.4 Tracking reports

It was found that numerous reports are provided to the planners to track relevant performance and goals and objectives in the planner's department. These reports are all based on data planners need to interpret into the correct information. None of the reports summarises the data into a visual display of information. The reports are also not user-friendly and in some cases, planners admitted to not knowing what the reports' data means and do not know of all the reports that are available to the planners.

Reports that need to be updated by the planners are also very time-consuming, because distributors (the planners' assistants) do not have the relevant user's access to update these reports. Planners also felt that there are too many reports and that it is difficult to keep track of all the reporting which happens in the company. More emphasis should therefore be placed on relevant KPI reports and that these reports should be integrated to form more uniformed reports which can be easily understood. The visual display of data can also be recommended as this will allow planners to access the relevant data more easily and use the reports to spot trends in the data.

4.5. Stock planning

When planning for stock it was seen that numerous factors need to be taken into account. It is not just a simple 'keep stock to cover the sales' approach. The same amount of the planners' energy is spent on planning stock levels as when planning for demand or sales. It was observed how important stock is for a company and to keep the correct stock levels. Planners need to constantly monitor the stock levels of the company to keep healthy stock levels as well as efficient and effective levels. Reports help the planners to monitor the stock levels of the company and set rules such as MDQ and stock covers aid planners in planning the correct stock levels. It was also observed how stock levels cannot always be connected to the sales of the product. The visual display of the stock also plays an important role.

4.6 Job satisfaction questionnaires

The results from the questionnaires seem to show that the overall employee satisfaction is at a satisfactory level in the company. Motivators in the company which lead to more or less employee satisfaction are present in the company. There are some hygiene factors in the company which can be improved such as, flexihours for the employees, market related salaries and a more fresh and clean environment to work in. Many employees commented that a lunch area would be beneficial as sitting at a workdesk during lunch hours can be demotivating.

Planners commented in the initial interviews that work from the distributors had to be rechecked, because the distributors did not have any work pride and would not be held responsible for any errors that occurred in the work. However, the questionnaires clearly showed that distributors do have work pride and enjoy the work.

It might be the fact that distributors feel there is no equality in the workplace and that the distributors' job is not valued enough. Perhaps involving the distributors in the company would help distributors to feel more like equals. It can also be recommended that distributors should be held accountable for some mistakes which may lead to the distributors putting more effort into the work that is delivered.

Overall the questionnaires showed that there is employee satisfaction present, but that there are hygiene factors which should be improved on otherwise the company may experience a lower employee satisfaction level which may contribute to lower motivator factors when employees do their work.

4.7 Current state versus future state

When studying the current versus future state, there are a lot of improvements that can be made. These are the goals and objectives of the company and although the data looks good on paper, when comparing the results versus what the goals, objectives and budget of the company were in the beginning of each year it can be noted that the goals, objectives and budget had not been reached in terms of what was planned.

There are numerous areas for improvement in all the variables, namely stock levels, stock control, product control, replenishments, gross sales margin, accurate demand forecasting, accurate sales forecasting and accurate promotional forecasting (as mentioned in Section 3.11). No training is given to the planners in terms of how to achieve the goals and objectives. Planners that have not been in the company that long need to rely on what the senior planner's comments and guidelines are. This can be a potential problem, and as observed, when senior planners have misunderstood a concept this misguided concept is also passed on to new planners.

Investing in the training of the employees in this company is something that is lacking and must be given attention. None of the employees in the company have been on any training in regards to planning, demand and sales forecasting methods, stock control or Microsoft Excel. As 100% of all the planners' work is in Microsoft Excel, employees who are not fully trained in this program before entering the company have a big disadvantage. Running reports or day-to-day work can take very long and the planners have to learn the skills needed to work on Microsoft Excel in their own time or during work hours, which again causes delays in reports and inefficient working times. Most of the planners step into this planning position as their first job and thus the employees need training in the methods for the company to enrich

the employees knowledge on how to work correct and efficiently. Training and overall clear communication must also be given to the planners on what the goals and objectives of the company are so all employees will have the same vision as to how the company wants the goals and objectives to be reached, refer to Table 27.

Table 27: Current state and future state

	1 0-70%	2 80-90%	3 90-95%	4 95-100%	5 100%+
Stock Levels			●	▲	
Stock Control			●	▲	
Product control			●	▲	
Replenishments		●		▲	
Gross sales margin					● ▲
Accurate demand		●		▲	
Accurate sales forecasting		●		▲	
Accurate promotional forecasting		●		▲	

●	Current state
▲	Future state

Where:	1: 0-40% achieved	2: 40-60% achieved
	3: 60-80% achieved	4: 80-100% achieved
	5: 100%+ achieved	

4.8 End goals and objectives

Throughout the study, the main focus was to establish the supply chain planning processes and activities that would contribute to the end goals and objectives of the company. It was observed that the overall planning done by the company’s planners are all in unison to reach these end goals and objectives. All the planners put their full effort into making each department in the company the most efficient and effective department in terms of stock, sales, profit and product availability. End goals and objectives are reached in this company, although the budget targeted goals and objectives are not always reached, the company shows growth each year on the previously set out goals and objectives.

Overall, it can be said that based on the data collected, the company is successful with their strategies used. These strategies form part of supply chain planning to reach end goals and objectives, but that it takes a lot of extra effort from the planners to reach these end goals and objectives without receiving the proper training as how to reach them. It was observed how these goals and objectives are communicated to the planners each year in budget meetings, in S&OP meetings and then again in monthly planning meetings. Yet again, planners are not given guidelines as to how these goals and objectives should be approached. Planners receive some level of support to reach these goals and objectives, however, it is recommended that more resources should be allocated to the planners in order to improve the overall efficiency and effectiveness of the planners and employees. The pressure in some departments may be overwhelming due to the lack of support or available resources, such as technical support or guidance.

Chapter 5 Final comments and areas for further research

5.1 Final comments

Based on the data collected during the case study, the supply chain activities which the planners are involved in are very important to the overall success of the company. The planners are involved in the key goals and objectives of the company and many of these goals and objectives are given to the planners to put into action and to achieve. It was seen that planners work constantly to improve upon factors such as gross sales margins, the right amount of stock that needs to be sent to stores, reviewing the range of products that are sold in the specific departments, keeping relations with the suppliers and achieving overall sales for the business.

It can thus be concluded, based on the data gathered, that throughout this case study, the importance of supply chain planning and the people involved in these planning activities are key to the success of this business. Without these activities the goals and objectives of the company cannot be met as planners plan for the daily and monthly activities of the company. The budgets, goals and objectives which are given to the planners are all closely monitored on a daily basis to keep track of the planner's short- and medium-term performance versus goals.

Without margins being tracked, without stock being tracked and without performance being tracked, the company goals and objectives will not be achieved. Thus, it may be crucial for the company that planners are effective and efficient in their methods of planning. Therefore, it must be advised that the needed training, support and guidance be given to the planners.

It came across that the overall planning in the business is effective, but planners work endless hours to reach each set out goal and objective for the company and this can be improved. Goals such as gross sales margins are being met as far as possible, stock is being controlled and forecasting is effective. Planning is necessary in each of the frozen, slushy and fluid planning horizons. Without planning goals, ideas and objectives are harder to obtain and planning will lead to the execution of these goals and objectives.

It was determined how important collaborative planning in the retail industry can be. Planners, buyers and suppliers should work together and have open communication about the targeted goals. Goals will then be reached by all of the parties involved. During the case study it was seen how important supplier relationships are. Good relationships with suppliers

stretch far beyond the normal transactional relationships and suppliers are then seen as business partners.

Planners in the company work hard and endless to reach the goals that are given to them. Knowledge and experience in the retail industry definitely helps give insight into planning to make the best decisions in regards to the company. In saying this, the planning role is one of the best methods to fully realise the importance of the supply chain network, the important factors in retail and the important drivers in a business. Planning does not only involve planning for the month's sales or what stock should be ordered, it also involves fully and irrevocable comprehension as to how planning affects a company and the supply chain as a whole. Planning errors can have bullwhip effects, not only on stock levels for all parties involved, but for all the SCP activities.

It is determined that planning can be such a crucial component in the supply chain. Each of the supply chain activities plays an important role in reaching the goals and objectives of the company.

5.1.1 Comments on literature overview

It is clear that numerous studies and literature are available that determine the importance of supply chain planning. There are several amounts of processes, activities and methods available which have been tried and tested to show the effectiveness of each. Different methods are available for companies to use and case studies are available to show the effectiveness or failure of methods which have been implemented. Companies can use these case studies and literature to broaden the scope of planning activities and processes that are currently being used and available. Companies can also learn from failed attempts of other companies. Here, companies can delve into what went wrong and keep it from happening again.

Apart from planning processes and activities, the future of retail must also be taken into account. Changes in the retail sector must be studied (refer to PwC Global Total Retail study) for retailers to act on the changes that are happening in the industry. Consumer buying behaviours and patterns are changing and retailers must adapt to these changes by implementing these into current planning processes and activities.

Other aspects such as employee satisfaction can also play a crucial role for a retailer. Employees with low motivators and hygiene factors can respond by either neglecting their

duties or can even leave the company. Retailers must invest in employee training which can be a cost saving benefit in the long term as well as beneficial to the employee.

5.2 Areas of further research

Possible areas for further research which were not included in the scope of this case study include the use of MRP or DDMRP systems to aid the planners in the planning and replenishments of orders. Further research can be done on the types of planning systems and what system will best suit the needs of this retailer. The placing of orders takes up a lot of time for both planners and distributors and these systems may aid the planners and distributors. Further research can also be conducted on the competencies of the planners and how this influences planning accuracy and company turn over.

List of abbreviations

A

A	Acquisitions costs per order or per delivery material
AC	Acquisition costs
AP	Approved plan

C

CI	Cost to hold one unit of inventory per year
CSOH	Closing stock on hand
COLS	Cost of lost sales
CC	Annual carrying costs

E

EOQ	Economic order quantity
-----	-------------------------

G

GPROS	Gross profit return on space
GPROI	Gross profit return on stock
Gsls	Gross sales

H

HCI	Human computer interaction
-----	----------------------------

I

InfoVis	Information visualisation
---------	---------------------------

K

KPIs	Key performance indicators
------	----------------------------

L

LY	Last year
----	-----------

M

MDQ	Minimum displayed quantity
-----	----------------------------

N

Nsls	Net sales
------	-----------

P

PA	Planning activities
PIS	Put into stock

PP	Planning Processes
PIS	Put into stock
RMS	Retail management system
<u>Q</u>	
Q	Order quantity for material units
<u>R</u>	
RRS	Recommended retail selling price
RMS	Retail management system
RRS	Recommended retail selling price
<u>S</u>	
SCP	Supply chain planning
S&OP	Sales and Operations Planning
SKU	Stock keeping unit
SSR	Stock and sales ratio
ST	Sell through percentage
<u>T</u>	
TC	Total costs
Tr	Transportation costs
TY	This year
<u>U</u>	
U	Expected annual usage of materials
<u>W</u>	
WP	Working plan
WC SOH	Warehouse closing stock on hand

References

- Baily, P., Farmer, D., Crocker, B. & Jessop, D., Jones, D. 2008. *Procurement Principles and Management*. Edinburgh Gate, England: Pearson Education Limited.
- Bernard, P. 1999. *Integrated Stock Management*. New York, N.Y: Wiley.
- Bower, P. 2005. 12 Most Common Threats to Sales and Operations Planning Process. *The Journal of Business Forecasting*.4:14.
- Brooks, J. 2009. *Representing Data Graphically*. [Online] Available: <http://www.uwlax.edu/faculty/brooks/bus230/handouts/designing%20graphs.pdf> [Cited 8 August 2013].
- Burt, D., Petcavage, S. & Pinkerton, R. 2010. *Supply Management*. Singapore: Mc Graw Hill.
- Capgemini. 2009. Leveraging Supply Chain Planning to Improve Overall Performance. [Online]. Available: [http://www.supplychainbrain.com/content/index.php?id=5032&cHash=081010&tx_tt_news\[tt_news\]=5520](http://www.supplychainbrain.com/content/index.php?id=5032&cHash=081010&tx_tt_news[tt_news]=5520) [Cited 09 July 2013].
- Chung, T., Rutherford, B. & Park, J. 2012. Understanding multifaceted job satisfaction of retail employees. *International Journal of Retail and Distribution Management*, (40)9:699-716.
- Deloitte. 2014. Retail, Wholesale & Distribution. [Online] Available: <http://www2.deloitte.com/za/en/pages/consumer-business/solutions/retail-wholesale-and-distribution.html> [Cited 01 March 2014].
- Fry, B. 2004. Computational Information Design. Published doctoral dissertation. Massachusetts: Massachusetts Institute of Technology
- Friend, S.C. & Walker, P.H. 2001. Welcome to the new world of merchandising. [Online] Available: <http://hbr.org/2001/11/welcome-to-the-new-world-of-merchandising/ar/1> [Cited 12 August 2014].
- Gartner, 2013. IT Glossary [Online]. Available: <http://www.gartner.com/it-glossary/scp-supply-chain-planning/> [Cited 22 June 2013].

- Gartner. 2012. Key Supply Chain Planning Processes [Online] Available: <http://my.gartner.com/portal/server.pt?open=512&objID=260&mode=2&PageID=3460702&resId=2067415&ref=QuickSearch&stkw=Key+Supply+Chain+Planning+Processes> [Cited 30 March 2014].
- Gartner. 2010. Top Supply Chain Planning Processes. [Online] Available: <http://my.gartner.com/portal/server.pt?open=512&objID=260&mode=2&PageID=3460702&resId=1288013&ref=QuickSearch&stkw=Top+Supply+Chain+Planning+Processes> [Cited 30 March 2014].
- Goodwin, P. 2010. The Holt-Winters Approach to Exponential Smoothing: 50 Years Old and Going Strong. *International Journal of Applied Forecasting*, 19:31.
- Hanke, E., Wichern, W., & Reitsch, G. 2001. *Business Forecasting*. United States of America: Prentice Hall.
- Harwell, J. 2006. Sales and Operational Planning in the Retail. *The Journal of Business Forecasting*, 4-10.
- Hill, M. 2013. *Retail Chain Chooses Dolphin to Accelerate Data Extraction for Audit Reporting and Enhance SAP ERP and BW Data Archiving*. [Online] Available: <http://www.prweb.com/releases/2013/1/prweb10380556.htm> [Cited 4 August 2013].
- Hitachi. 2007. Sales and Operations Planning- The Basics. [Online] Available: http://www.hitachiconsulting.com/files/pdfRepository/WP_SalesOperationsPlanning.pdf [Cited 19 October 2013].
- Huang, H.-G., Chang, P.-L., & Chou, Y.-C. 2008. Demand forecasting and smoothing capacity planning for products with high random demand volatility. *International Journal of Production Research*, 46(120):3223-3232.
- Hüber, A.H., Kuhn H., & Sternbeck M.G. 2013. Demand and Supply Chain Planning in Grocery Retail: An Operations Planning Framework. *International Journal of Retail & Distribution Management*.41(7):512-530.
- Kalekar, P. 2004. Time series Forecasting using Holt-Winters Exponential Smoothing. *Kanwal Rekhi School of Information Technology*.
- Lamb, C., Hair, J., McDaniel, C., Boshoff, C., & Terblanche, N. 2008. *Marketing*. South Africa: Oxford University Press.

- Langley, C.J., Coyle, J.J., Gibson, B.J., Novack, R.A. & Bardi, E.J. 2008. *Managing Supply Chains – A Logistics Approach*. Canada, South-Western: Cengage Learning.
- Makridakis, S., & Wheelwright, S.C. 1978. *Forecasting Methods and Applications*. New York: John Wiley & Sons Inc.
- Makridakis, S., Wheelwright, S.C., & Hyndman, R.J., 1998. *Forecasting Methods and Applications*. New York: John Wiley & Sons Inc.
- McLeod, S. 2008a. Case Study Method. [Online] Available: <http://www.simplypsychology.org/case-study.html> [Cited 5 August 2014].
- McLeod, S. 2008b. Likert Scale. [Online] Available: <http://www.simplypsychology.org/likert-scale.html> [Cited 11 August 2014].
- McLeod, S. 2008c. Simple Psychology. [Online] Available: <http://www.simplypsychology.org/likert-scale.html> [Cited 8 August 2013].
- Milliken, A. Fall 2008. Sales and Operations Planning: Building the Foundation. *The Journal of Business Forecasting*, 4-12.
- Mouton, J. 2001. *How to succeed in our Masters and Doctoral Studies.: A South African Guide and Resource Book*. Stellenbosch. Van Schaik.
- Mulbraton, C. 2009. Visualising Economics Blog. [Online] Available: <http://visualizingeconomics.com/blog/2009/07/12/data-scientist-data-geek-designer/> [Cited 3 August 2013].
- Parker Avery Group. 2013. Stock Planning Methods: The Proper Approach to Stock Planning. [Online] Available: http://www.parkeravery.com/povs/PAG_POV_Stock_Planning_Methods.pdf [Cited 24 November 2013].
- Pendrous, R. 2007. Tesco puts poor performing suppliers in 'intensive care'. [Online] Available: <http://www.foodmanufacture.co.uk/Business-News/Tesco-puts-poor-performing-suppliers-in-intensive-care> [Cited 1 May 2014].
- Princeton University. 2014. What is a Primary Source? [Online] Available: <http://www.princeton.edu/~refdesk/primary2.html> [Cited 26 July 2014].
- Retailer's personal documentation. 2013. Available on request. [Cited 26 June 2013].

- Robbins, S.P., & Judge, T.A., .2010. *Organizational Behaviour*. 14th ed. New Jersey: Prentice Hall.
- PwC, 2014. Global Total Retail Survey: Consumer expectations driving the next retail business model. [Online] Available: www.Pwc.com/totalretail [Cited 8 March 2014].
- Sina. Sina's Logistics Blog. 2010. [Online] Available: <http://sinaslogisticsblog.blogspot.com/2010/04/bullwhip-effect.html> [Cited 6 July 2013].
- State Government of Victoria. 2012. *Why retain employees?* [Online] Available: <http://www.dhs.vic.gov.au/funded-agency-channel/management-toolkit/workforce/retention/why-retain-employees> [Cited 22 March 2014].
- Stock, J., & Lambert, M. 2001. *Strategic Logistics Measurement*. Singapore: Mc Graw Hill Irwin.
- SupplyChainBrain, Critical success factors for supply chain planning, 2013a. [Online] Available: <http://www.supplychainbrain.com/content/nc/industry-verticals/food-beverage/single-article-page/article/critical-success-factors-for-supply-chain-planning-1/> [Cited 16 February 2014].
- SupplyChainBrain, Global Supply-Chain Planning: It's Getting Tougher, 2013b. (Video Recording) [Online] Available: [http://www.supplychainbrain.com/content/index.php?id=5032&cHash=081010&tx_tt_news\[tt_news\]=22535](http://www.supplychainbrain.com/content/index.php?id=5032&cHash=081010&tx_tt_news[tt_news]=22535) [Cited 16 February, 2014].
- Supply Chain Digest, 2006. *The 11 Greatest Supply Chain Disasters*. [Online] Available: <http://www2.isye.gatech.edu/~jjb/wh/tidbits/top-sc-disasters.pdf> [Cited 22 June 2013].
- Tableau, 2013 (video file). [Online] Available: <http://www.tableausoftware.com/products/online#visualize-data-like-never-before> [Cited 3 August 2013].
- Wang, J., Hsieh, S. & Hsu, P. 2011. Advanced sales and operations planning framework in a company supply chain. *International Journal of Computer Integrated Manufacturing*, 25(3): 248–262.

Waters, D. 2003. *Stock Control and Management*. South Gate, Chichester, West Sussex, England:Wiley Publishing.

Yang, B., & Geunes, J. 2007. Stock and lead time planning with lead-time sensitive demand. *IIE Transactions*, 39:439-441.

Appendix A

Questionnaire for Work Satisfaction and Dissatisfaction

All answers in the questionnaire will be kept confidential. Persons taking part in the questionnaire will remain anonymous.

Date: _____

Please circle your position:

Buyer / Distributor / Planner

Please indicate with an x, in the box provided, your answer to the following questions:

Example: I like listening to music:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1. When performing well at my job, I am given recognition by my supervisor(s).

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

2. I enjoy my job.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

3. I have high responsibility for the tasks that are given to me.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

4. I can grow in my career given my current position.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

5. I have achieved a lot in my current position.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

6. I am satisfied with my supervisor(s).

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

7. I have a good relationship with my supervisor(s).

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

8. I am satisfied with my current working conditions.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

9. I am satisfied with my salary when comparing it to my job description.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

10. I have a good relationship with my peers.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

11. I have a good relationship with my co-workers.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

12. I am certain of my job security, i.e. I will not be retrenched or dismissed.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

13. I am satisfied with my working hours.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

14. I am rewarded for working overtime.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

15. Busy/peak months demotivate me.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

16. I have high responsibilities in the tasks that are given to me.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

17. I have work pride.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

18. I enjoy my work.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="checkbox"/>				

19. What suggestions do you have to improve employee satisfaction at the workplace?

** Thank you for completing this questionnaire!**