

UNIVERSITY OF KWAZULU-NATAL

**THE DEMAND FOR AGILE/LEAGILE THIRD PARTY
LOGISTICS SERVICES: AN ASSESSMENT OF
DAIRY INDUSTRY NEEDS**

By

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DECLARATION

I Theorene Sinegugu Mbili declare that

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ABSTRACT

The dairy industry is one of the fastest growing industries worldwide. This industry produces products that are used daily by many households and are regarded as a very important source of nutrition. Dairy products are usually sold in bulk to retailers who then sell to thousands of consumers on a daily basis. Since this is a product that is consumed daily, the assumption is that its demand can be forecast easily. There is a general assumption that because these are commodity products they need to be produced and supplied by a very lean system. However, this does not prove to be entirely true with dairy products.

The dairy industry produces products that have a very short life span and have special requirements in terms of packaging, storage and delivery. With a short shelf life these products need to be delivered to retailers every day and cannot be stored in warehouses or retail outlets for long periods of time. As the dairy industry continues to grow, competition is likely to increase. This will induce organisations to redouble their efforts to differentiate their offerings. Increasingly, the industry may be expected to use third party logistics providers (generally referred to as 3PLs) that are agile and innovative. These 3PLs should work as an integral part of the organisation and leverage collaborative efforts to add value and increase competitive advantage in the dairy industry.

Despite an apparent need for 3PLs, the findings of this study indicate that at present the dairy industry cannot afford to use these service providers. The 3PLs have proved to be very expensive and the dairy industry is not making sufficient money to meet the costs of the 3PLs that they require. In future, dairy companies may be compelled to use 3PLs since they need to focus their resources on improving their products. The 3PLs should be introduced for their competences, skills and expertise to service the dairy companies' logistics needs and to assist in gaining a competitive advantage in this area. Third party logistics providers have the potential to add value to the dairy industry supply chain by providing it with the latest technological advancements that will contribute to greater effectiveness and efficiency.

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LIST OF ABBREVIATIONS

3PLS	Third Party Logistics Provider
FMCG	Fast Moving Consumer Good
IT	Information Technology
ICT	Information and Communication Technology
EDI	Electronic Data Interchange
RFID	Radio-Frequency Identification Devices
QR	Quick Response
VMI	Vendor Managed Inventory
SKU	Stock Keeping Units
ZIPS	Zero Inventory Production System
FIFO	First In First Out
QTT	Tracking and Tracing Systems
ERP	Enterprise resources planning
SMAS	Safety monitoring and Assurance systems
Epos	Electronic Point of Sale
CAD	Computer-Aided Design
CAM	Computer-Aided Manufacturing

CHAPTER 1: INTRODUCTION

1.1 Introduction

Third-party logistics providers (3PLs) refer to outsourced organisations that provide other organisations with logistics services. These service providers have been used for decades and are now being used even more extensively by many companies. They provide a number of specialist services that would otherwise prove difficult to supply cost effectively in-house (Ko and Kim, 2006: 441). Over the past few years 3PLs have had to develop and evolve to satisfy the demands of lean supply chains. A lean supply chain is one where all member organisations are interdependent and work together to fulfil customer needs and eliminate as much waste as possible within their systems. The concept of lean has been introduced into supply chain strategies to reduce supply chain costs (Ko et al., 2006: 441). Lean production is a concept that was introduced in the late 1980s and is described as a system that classifies any expenditure or use of resources, other than to add value for the end customer, as wasteful (Holweg, 2007: 423). Any activity that the final customer is not willing to pay for, according to this philosophy, is considered waste. The concept of lean production later grew and evolved into such areas as lean supply chain, lean thinking and lean logistics.

However, more recently, in many industries, the focus has shifted from lean supply chains to more agile supply chains. These supply chains are more capable of handling unforeseen circumstances and have the ability to constantly produce new and innovative products with the highest level of flexibility and speed (Christopher, 2000: 37). Agility, also known as agile, is a concept that suggests that the focus should be on customers and the firm's level of responsiveness, flexibility and speed (Reichhart and Holweg, 2007: 1145). Agility is usually achieved by cooperation between parties in the supply chain through the sharing of real time information (Ambe, 2010: 7). This move to agility has also dictated that 3PLs follow the same imperative. However, lean strategies that focus on eliminating waste should not be disregarded as 3PLs move more towards an agile strategy that focuses on the customer and being responsive to the changes in the market (Qrunfleh and Tarafdar, 2013: 573). The combination of agility and lean is known as leagile. The term "leagile" was introduced when Boschi, Raymunda and Fusco (2010: 7) discovered that combining lean and agile in the supply chain actually

works much better than when just one strategy is used. This concept will be further explained in subsequent chapters.

This study focuses on the logistics services, and road transportation services in particular, that are offered by 3PLs or the internal logistics departments of companies in the dairy industry. The study seeks to determine the extent to which 3PLs or in-house logistics departments are now striving to achieve agility rather than leanness in their supply chains. Firstly, the study seeks to establish if there is a need for 3PLs serving the dairy industry to become agile. Thereafter, the study explores the challenges that may confront 3PLs in their quest to become more agile. Lastly, it considers possible future developments within this field in the dairy industry.

1.2 Background to the Study

In the past, 3PLs have provided basic services such as transportation, warehousing and tracking and tracing (Ko et al., 2006: 441). A large number of companies in various industries have recently demanded that their 3PLs or in-house logistics services provide them with more responsive logistics services. This requirement is driven by a constantly changing global market that also requires changes in supply chains (Flint, 2004: 47). The changes in the market and the supply chain compels the 3PLS that provide services to other organisation to keep up with these changes. In many industries, including the dairy industry, there is a perception that there is an increasing need for agility in the supply chain. This need may be attributed to customers that seek more customised, fresher products with high levels of availability. However, these demands are made in the context of a highly competitive market where there is also a substantial need for organisations to introduce cost cutting measures and a need for increased velocity of products through the supply chain to reduce pipeline fill (Ross, 2013: 15).

Companies wish to minimise costs, yet also achieve flexibility, responsiveness and efficiency of the entire supply chain in which they operate (Duclos, Vokurka and Lummus, 2003: 447). A major difficulty arises as agile supply chains generally prove to be considerably more expensive and more suited to high value products such as high-end furniture products or fashion items (Easey, 2009: 21). There is an increasing body of research that has examined agile and leagile supply chains of high-value fashion products but there is little published research that examines lower value products, such

as dairy products. These products have a very short life span and are also becoming more and more expensive. These products may also require an agile supply chain since they need to be moved quickly in the pipeline (Hobbs and Young, 2000: 133). Consequently, this study focuses on the operations of 3PLs and in-house logistics departments that serve the supply chains of dairy products.

1.3 Problem Statement

This study addresses the following problem statement: To what extent are logistics providers in South Africa (both external 3PLs and companies' in-house logistics departments) required to deliver agile or leagile services to the dairy industry? The study seeks to determine the nature of the agile or leagile services that the dairy industry requires and to identify the challenges that logistics providers encounter in their quest to become agile.

1.4 Research Questions

- To what extent do South African 3PLs provide agile, leagile or lean services to the dairy industry?
- To what extent does the dairy industry in South Africa require agile logistics services from 3PLs?
- How challenging is it, or will it be, for South African 3PLs to provide agile or leagile services to dairy companies?
- What are the specific challenges that 3PLs face, or will face, when attempting to implement agile strategies for the dairy industry?
- What will be the future needs of stakeholders in the dairy industry; the dairy companies, 3PLs and retail customers?

1.5 Research Objectives

- To assess the type of service currently offered by South African 3PLs serving the dairy industry.
- To determine the extent to which the dairy industry in South Africa requires agile services from 3PLs.

- To assess the level of difficulty that 3PLs are likely to face when they provide agile or leagile services for dairy companies.
- To identify the specific challenges that 3PLs face when attempting to implement agile strategies.
- To identify the future needs of stakeholders in the dairy industry i.e. the dairy companies, 3PLs and retail customers.

1.6 The rationale for the research

A large number of manufacturing and service providing organisations prefer to focus on their core competencies and tend to outsource non-core activities to third party providers. However, third party logistics providers, as partners in the supply chain, are not only expected to provide basic logistics activities but are also expected to introduce systems that will add value to their clients, will assist them to eliminate waste, reduce costs and allow them to achieve greater flexibility (Zacharia, Sanders and Nix, 2011: 40). This requires a major change in the role of 3PLs and suggests that there is a need to investigate the extent to which the business operations of 3PLs are aligned with those of their clients.

The relevance of this research project is supported by the fact that customers now demand customised and fresh products at a specific time and they are not willing to wait or compromise (Pine, Peppers, and Rogers, 2010: 114). The demand for fresh, customised products makes it important that both manufacturers and transporters are able to get products to final customers at the right time, in the right quantity and with optimum quality. Bosona and Grebsenbert (2011: 63) suggest that logistics research in the food and agricultural sector can make an important contribution to the application of such recent logistics innovations as agile logistics.

The literature also indicates that researchers have examined topics such as the comparison between lean and agile strategies (Conboy and Fitzgerald, 2004: 39), the effectiveness of agility as well as the concept of agility within organisations (Schonsleben et al., 2000: 39). Some authors have also examined topics related to changing from lean production to more agile strategies. However, this study differs in that it seeks to investigate how 3PLs or in-house logistics services can accommodate the agile nature of their supply chains.

This study does not consider operations of just one tier of the supply chain; it also examines how the agility of 3PLs and logistics departments can contribute to improving the efficiency and effectiveness of processes within the entire dairy industry supply chain.

1.7 The linkage of the study to existing knowledge

Current research indicates that leanness rather than agility is appropriate for functional products which are products that can be produced in bulk and at a low cost. This category includes products such as bread and other fast moving consumer goods (FMCG) (Ambe, 2010: 8). Mason-Jones *et al.* (2000: 4065) also support this statement by stating that agility is specifically suited to items that have unpredictable demand, whereas lean is more appropriate for commodity goods. This study supports the view that agility is required for products that are of high value and have highly unpredictable demand, but seeks to maintain that agility is also very desirable for commodity products that have a short life span, such as fresh products.

Tompkins (1999, cited in Mothilal, *et al.*, 2011: 2411) states that 3PLs provide their clients with a lot of advantages which include; cost minimisation, economies of scale, economies of scope and value-added services that provide the final customers with the right product at the right time with optimum quality. The focus of this study is on the added value provided by flexibility, responsiveness and being customer focused, which comes with agility. The investigation will be looking at how this change will assist the logistics department and the 3PL industry to service their clients better. The study also examines how the move from a lean to an agile strategy within the fresh products market can be achieved in a South African context.

1.8 Conceptual Framework that guides the study

The conceptual framework guiding this study contends that an agile supply chain is concerned with responding to changes, uncertainties and unpredictability within the business environment (Christopher, 2003:38). Since every organisation experiences some level of change, uncertainty and unpredictability, any agile supply chain or organisation needs to have strategies in place that will assist them to determine and overcome or accommodate such situations. This is something the lean strategy has

struggled to accomplish in past years (Christopher, 2003:38). According to this framework the strategies that can be put in place in order to deal with the unexpected changes within the markets are responsiveness, competence, flexibility/adaptability, and quickness/speed (Lin et al, 2006; 287).

The elements of the Lin, Chiu and Chu model are illustrated in figure 1.1 and include:

- **Agile drivers-** the agile drivers are changes in the market, competition, customer requirements, technology and various social factors. The model proposes that most organisations will face such changes within the environment that they operate in and although different industries face different or unique changes and situations, they are all facing changes that necessitate agility (Lin et al, 2006; 287).
- **Agile capability-** the model explains that such capabilities as responsiveness, competence, flexibility/adaptability, and quickness/speed are the attributes necessary for organisations or entire supply chains to operate with agility (Lin et al, 2006: 287). *Responsiveness* is the ability of an organisation to identify changes and respond quickly to them. *Competence* is the ability to rapidly realise the objectives of the organisation and direct every activity at achieving these objectives. *Flexibility and adaptability* are the ability to use different strategies and activities to achieve the same goal. *Quickness and speed* are the ability of an organisation or particular individual to complete an activity as quickly as possible (Lin et al, 2006: 287).
- **Agility enablers/pillars-** the model proposes that agility enablers are the key areas that need to be initiated in order to ensure that agility is achieved in a supply chain. These enablers are strategies that foster collaborative relationships, process integration, information integration and customer or market sensitivity within the supply chain (Lin et al, 2006: 287).

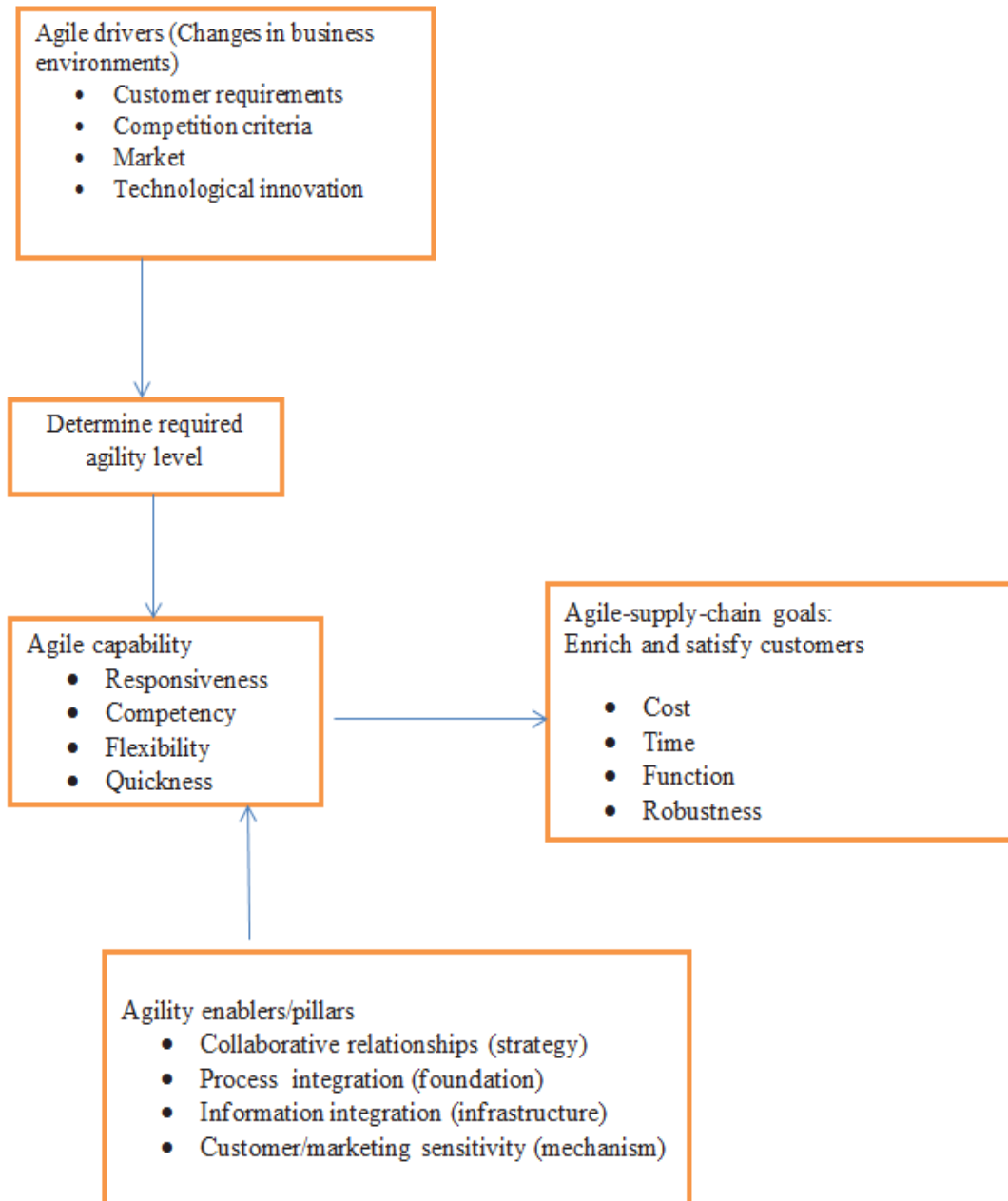


Figure 1.1 Conceptual model of an agile enterprise.

Source: Lin, Chiu and Chu, 2006: 287

- **Agile supply chain goals-** the overall goal of an agile system is to enrich and satisfy customers in terms of the level of service and quality of products delivered. The level of satisfaction may be increased by shortening the lead time, minimising the costs of doing business, being robust and being purpose or activity driven (Lin et al, 2006; 287).

The Lin, Chiu and Chu model guided the researcher in the following manner:

- **Agile drivers-** consideration of these drivers assisted in evaluating if the dairy industry is facing any of these changes in the market place with regard to competition, changes in customer desire, technology changes and changes in social factors. The extent to which the dairy industry may be affected by these changes was assessed to determine if these changes are significant enough to stimulate the need for agility within the industry.
- **Agile capability-** the extent to which the dairy industry and its logistics providers need agile capabilities was assessed in terms of their current level of responsiveness, competence, flexibility, and quickness.
- **Agility enablers/pillars-** an assessment of these enablers provided an indication of the potential that the dairy industry, as well as its logistics providers, have to develop agile capabilities.
- **Agile supply chain goals-** an assessment of the importance attached to these goals by retailers and the end customers of the dairy supply chain provided an indication of the relative importance of cost, time, function and robustness in the supply chain.

This framework is relevant as it encompasses all the drivers, requirements, goals and capabilities of an agile system. The framework assists in assessing dairy companies' and customers' needs for agility. This framework makes it possible to assess if 3PLs are needed and if they are needed to provide agile services or not.

1.9 Overview of the dissertation

Chapter 2 and 3: literature review

These two chapters review the available literature relevant to appropriate areas of logistics, supply chain management, lean, agile and leagile. These chapters look at the requirements of a lean, agile or leagile supply chain and explain these terms in detail. The review considers whether the dairy industry should favour a lean, agile or a leagile supply chain considering the value of the products, the nature of the products, as well as

other cost implications. These chapters also consider the functions of logistics in an organisation and how these can be done in a more efficient and cost effective manner.

Chapter 4: Research methodology

This chapter focuses on the manner in which data was been collected, the type of data that was collected, the research instruments that were used to collect data, the study site and the participants in the study. The data analysis techniques and method of analysis used are also highlighted in this chapter as well as the ethical considerations and limitations of this study.

Chapter 5: Data Analysis and Findings

The findings of the study are presented and the manner in which the data was analysed is explained. This explanation creates a foundation for the reader to understand how the conclusions in the following chapter were reached.

This chapter focuses on describing the conclusions that were reached after analysing the data and considering the relevant literature presented in chapter 2 and 3. The conclusions provided in this chapter are intended to provide dairy companies with guidance concerning the best strategy to be used in managing their logistics services.

1.10 Conclusion

The introductory chapter has outlined what the research focused on and what each chapter discusses. The remainder of this dissertation provides a deeper insight that contributes to answering the research questions that are proposed in this chapter. The following literature review chapter highlights the important points from the available literature relating to this study.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Organisations across the world are constantly seeking better ways of conducting business. These continuous developments in business have also enabled organisations to understand that they cannot operate all by themselves for themselves if they wish to remain efficient and competitive. These organisations have realised that they exist in a bigger environment where their actions have an effect on other stakeholders and ultimately on their level of performance (McLaren, Head, and Yuan, 2002: 349). Manufacturing organisations have also realised that their success is based on the performance of their suppliers and the retailers that they deal with. Suppliers have come to a similar realisation that they rely on the manufacturers to be successful. This realisation has made a number of organisations value and put more effort into establishing a system-wide approach to managing stakeholders and processes along their supply chains in order to be competitive (McLaren, et al, 2002: 349).

Organisations presently do not compete head-to-head as individual companies but compete through their supply chains (Frohlich and Westbrook, 2001:196). This means that the stakeholders that each organisation selects to partner with must be chosen strategically and the stakeholders' manner of doing business must complement and be aligned with that of the focal organisation and its objectives (Goldsby, Griffis, and Roath, 2006: 58). As an example, if the focal company produces products that require the implementation of lean strategies, it must take measures to ensure that it selects suppliers and service providers that are using a lean strategy or are able to support a lean strategy.

This literature review chapter considers the reasons why firms have lean, agile and leagile strategies in place. Secondly, it will highlight the need for the dairy industry to use 3PLs and the benefits thereof. The review will go on to highlight and discuss the concept of agility and why 3PLs in the dairy industry need to consider being agile or leagile in their operations.

2.2 The definition of lean

Lean is described as a philosophy that considers any non-value adding activity that the final customer is not willing to pay for as waste (Matthias, 2007: 423). Similarly, Tompkins (2003), cited in Mohammed et al. (2008: 345) highlights that lean is not just about eliminating waste but also about adding value for the final customer. Papadopoulos and Ozbayrak (2005:784) added that the lean system was introduced with the aim of eliminating waste while also emphasising the need for continuous improvement.

The lean system has further developed from its initial “identity” of mainly being applied to the manufacturing processes (Papadopoulou and Ozbayrak, 2005: 796). The philosophy, which has developed over the years, has expanded with the addition of concepts such as lean practices, lean systems, lean logistics and lean enterprises (Matthias, 2007: 423). Lean is also often associated with principles such as continuous improvement, Just-in-Time (JIT) production, preventative maintenance, visual controls, kanban systems, setup time reduction, standardised work procedures, and supplier involvement (Pettersen, 2009: 15).

There are officially seven wastes that the lean system identifies and believes need to be reduced or eliminated within the organisation and also within the supply chain. These are namely overproduction, waiting, over processing, unnecessary motion, production of defects, inventory and transportation (Bhasin and Burcher, 2006:56). However, some of these “wastes” are unavoidable, hence organisations should work at minimising them to increase the smooth running of the business. These are wastes such as transportation, waiting and inventory. Organisations are constantly trying to eliminate waste so that they run smoothly and also don't incur unnecessary costs.

The benefits of the lean principle are the elimination of waste, faster production, elimination of unnecessary costs and continually maintaining lean and clean working environments with no clutter. The benefits of adapting the lean philosophy , experienced in non-manufacturing industries like 3PLs, include decreased lead times, improved knowledge management, more robust activities and reduced inventories from manufacturers (Melton, 2005: 663).

The lean system is known to be favourable to supply chains that mainly deal with products that have stable and highly predictable demand, such as fast moving consumer goods (FMCG). Products, such as fashion items, that have unpredictable demand are more suitably catered for using agile strategies (Hilletoft, 2012: 1276).

Although lean and agility are related in that these philosophies are customer focused and focused on providing the right product/ service to the right customer at the right time with minimal costs, some organisations that operate using lean strategies are far from agile. These two concepts are thus related but in certain respects significantly different. The lean system is more effective when producing and delivering items in bulk (Konecka, 2010: 25). The lean system may prove inadequate with regard to items that are perishable and cannot easily be produced and stored to await customer orders.

2.3 Agility in an organisation

The idea of agility was developed by a group of researchers at the Iacocca Institute, Lehigh University in 1991 (Mansouri, Ganguly and Mostashari, 2011: 142). The authors defined agility as ‘a manufacturing system with extraordinary capabilities to shift quickly among product models or product lines, ideally in real time, to meet the rapidly changing customer and business needs’ (Mansouri et al, 2011: 142). Matwale, Datta, Mahapatra (2012: 1) provide a broader definition and refer to agility as the capability of an organisation to respond quickly to different customer demands in an efficient manner. Agility comprises two factors; responding to anticipated and unanticipated changes, as well as exploiting and taking advantage of changes in the environment or industry and creating opportunities out of them (Bernard and Hanna, 2009: 36).

Mansouri, et al (2011: 143) also state that agile organisations or supply chains are not only reactive but are very proactive in the manner that they anticipate any unforeseen changes in business strategies, action plans and customers. Swafford, Ghosh and Murthy (2008: 290) agree with the views of Mansouri et al (2011: 143), by stipulating that agility is mainly about coping with unexpected challenges and to survive unique threats of the business environment along with capitalising on any opportunities that may present themselves. This agility can only be achieved through working together with all the departments in the organisation as well as with external stakeholders (Swafford et al, 2008: 290).

Agility involves using market knowledge and a virtual corporation to exploit opportunities in a forever changing environment (Faisal, Banwet and Shankar, 2006: 258). This has not been shown to be a very easy task; authors such as Gilgor and Holcomb (2012: 162) stress that an agile supply chain or organisation needs to have the following characteristics in order to be successful in implementing its agile strategies:

- **Market sensitivity**- which can be obtained through working with point of sale data;
- **Virtual supply chains**- which are supply chains that are based on real time information (obtained through the use of technology) instead of inventory;
- **Networks**- these are networks that have knowledge and information about the marketplace and share it within the supply chain that they work in (Gilgor and Holcomb, 2014: 162)
- **Process integration**- which can be achieved by collaboration between buyers and suppliers through initiatives such as joint product development (Guojun , 2006: 55)

2.3.1 Improvements associated with agility

When agility was first implemented, it was presented to the industry as a concept that could provide more advantages than lean systems had been providing. The concept of agility promised to advance organisations a little further than leanness was able to do (Barve, 2011: 325).

One of the main concepts associated with agility is that an organisation and its supply chain should not only be effective, efficient and lean, but should also be customer-focused, flexible and responsive. In addition, organisations should also be able to add value, be quality-driven and proactive rather than reactive (Barve, 2011: 325). According to Luckin (2012: 58), the difference between lean and agility is that in some cases lean does not allow efficient management of internal processes and relations. Luckin (2012: 58) also stresses that lean is more favourable for products that are highly predictable. The author states that for products that are highly sensitive, are of low volume, have unpredictable customer requirements or have short life spans, an agile approach within their supply chain is preferable. Swafford et al. (2008: 288) mentions

that when agility emerged, most organisations started to witness their supply chains responding better to unforeseen circumstances and becoming more market oriented.

The concept of agility came with initiatives such as information sharing. Information-sharing in an agile supply chain enables organisations to freely share certain information such as demand order, specific customer related information, and delivery schedules (Li, Lin, Wang and Yan, 2006: 426).. This is done in order to contribute to the smooth functioning of the supply chain (Li, Lin, Wang and Yan, 2006: 426). There are a number of tools that supply chains have been using and still are using to communicate and remain agile between suppliers, 3PLs and customers. Some of these tools are Quick Response (QR), Efficient Consumer Response (ECR), Vendor Managed Inventory (VMI), Continuous Replenishment Programs (CRP) and Electronic Data Interchange (EDI) (Li, Lin, Wang and Yan, 2006: 426). According to Swafford et al (2008: 288), agility has also afforded organisations in the supply chain a chance to compete in terms of delivery reliability, responsiveness, and frequency of new product developments.

The idea of information sharing is not only focused on external stakeholders but is essential within the organisation. Cross-functional teams are also crucial in the organisation. The logistics department needs to constantly be communicating with other departments in the organisation, such as the purchasing, marketing, operations and the finance departments in order to make sure that they have all the necessary information about the market and specific customers (Gligor and Holcomb, 2012: 438).

Agility also requires organisations to have infrastructure that will assist the organisation to meet the customer's needs (Gligor and Holcomb, 2012: 438). The necessary techniques and infrastructure include integration of technology, enterprise assimilation and learning. This infrastructure also have the ability to delay material or product design specification so that the organisation can keep the products in standardised formats and only customise according to the specifications of in-coming orders (Gligor and Holcomb, 2012: 438).

Swafford et al. (2008: 289) declare that while marketing has placed a focus on managing demand, which involves managing, monitoring and generating demand, supply chain management focuses on matching the supply of products and services to the demand. Synchronised supply and demand requires integration within the

organisation and also with the external stakeholders (Baramichia, Zimmers and Marangos, 2007: 335). Only upon the introduction of the concept of agility did it become apparent that it is only through end-to-end integration and collaboration that the entire supply chain can quickly adapt to demand changes (Christopher and Towil, 2001:236),

Strategies such as postponement, which rely on communication and integration, have been introduced in different markets in order to support organisations and supply chains in their quest to become agile. Postponement is a strategy that is used by many organisations that desire to keep their products in a standard format and only customise them when the customer orders (Yangy and Burnsy, 2003:2075).

Postponement assists in achieving increased efficiencies in the supply chain (Qrunfleh and Tarafdar, 2003:574). It reduces risks of stockouts and the risk of holding too much finished stock that may not be required by customers (Qrunfleh and Tarafdar, 2003:574). Products that have short life spans, like dairy products, benefit considerably from agile strategies because they can be produced only when there is a confirmed demand by the buyers (Lehtonen, Holmström and Slotte, 1999:53). An example of this in the dairy industry would be the preparation of yoghurt. Plain yoghurt may be manufactured and stored in that state with flavour added according to specification only upon receipt of an order from a retailer. This may assist the organisation not to waste and produce more of one flavour only to discover that the actual orders are entirely different.

2.3.2 Flexibility and responsiveness as part of agility

There is a tendency of people and organisations to equate agility with responsiveness or flexibility. Barve (2011: 325) elaborates on why agility cannot be equated with flexibility or responsiveness. He states that agility includes flexibility and responsiveness but in addition it also includes effectiveness, efficiency, lean, quality driven initiatives, being proactive, being customer focused and adding value for the final customer. Flexibility as well and responsiveness will be further explained below

2.3.2.1 Flexibility

The concept of flexibility is known as “the ability to make alterations with little drawback in terms of time, performance and increase in costs” (Upton, 1994 cited in Mohammed and Banwet, 2008: 341). Mohammed and Banwet (2008: 341) state that it is the ability of a system or organisation to adjust to changes in its internal and external environments. Flexibility is sometimes associated with systems that have been designed and have the ability to quickly change in order to accommodate circumstances that are not “normal”. These systems are designed such that they allow for a certain level of flexibility. This actually means that flexibility can be pre-planned well in advance (Bernard and Hanna, 2009: 41).

The role of flexibility in any system is to assist the system so that it may be able to attend to both certain and uncertain circumstances effectively and efficiently. Mohammed and Banwet (2008: 341) state that flexibility is required in both the internal and external environments of the organisation. Internal flexibility refers to “a set of strategies that the company puts in place in order to respond to any changes within the organisation” (Sa´nchez and Pe´rez, 2005: 685). The scope of the external environment includes reactive and proactive strategies. The former refers to the reactive use of flexibility that accommodates or rectifies circumstances that have already occurred. The latter is when flexibility is used proactively before an inconvenience has occurred. This is very effective at raising customer expectations and in gaining competitive advantage and first mover advantage within an industry (Bernard and Hanna, 2009: 33).

Flexibility is a crucial strategy for market responsiveness when the supply chain is faced with uncertainties. There are three important factors that Mohammed and Banwet (2008: 341) also state that are important to consider when it comes to the flexibility of the system. Firstly it is the range of states the system can adopt, secondly it is the cost of moving from one state to another and lastly the time required to move from one state to another. According to Green, Whitten and Inman (2008: 321) the investment on flexibility must be justifiable in terms of the cost associated with the activity and the returns; whether in the long-term or short-term.

2.3.2.2 Responsiveness

Responsiveness in an organisation or supply chain is equated with a system that involves the ability of an organisation to purposefully make rapid changes that will assist the organisation in one way or another to best provide for its customers (Bernard and Hanna, 2009: 38). Barclay and Dann (1996: 21) describe responsiveness as “the ability of an organisation to respond to changes in a desired and timely manner to certain events.”

A study by Kritchanchai and Maccarthy (1999) cited in Kritchanchai (2004: 384) defined responsiveness using four components. These components are stimuli, awareness, capabilities and goals. Stimuli represent the factors that drive responsiveness. Awareness requires that an organisation or a supply chain be aware of the drivers (stimuli) that they need to respond to. Lastly capabilities and goals refer to the ability of an organisation to respond to different drivers and to have targets set for the desired level of responsiveness (Kritchanchai, 2004: 384). According to Kritchanchai (2004: 385) being able to predict market responsiveness is very important for consumer industries and their supply chains. This is also related to the ability to accurately forecast consumer demands (Kritchanchai, 2004: 385).

2.4 Achieving leagile in the supply chain

Though the concepts of lean and agile seem to be very simple by definition, many organisations have realised the complexity of these concepts as they embarked on a journey to implement them within their organisations. It appears that not only do they find difficulty in deciding which one to use or which one suites their supply chains best but it also seems that these paradigms are not well understood by most of the people who attempt to implement them (Goldsby, Griffis, and Roath, 2006: 58). One may assume that it is because of the complexity and confusion that come with the lean and agile concepts that Boschi, Raymunda and Fusco (2010: 7) introduced the term “leagile”, a concept they described as a combination of both “lean” and “agile strategies which can be implemented for supply chain optimisation. The key to achieving agility and lean (leagile) is to be able to work with other parties as a team, with common goals such as efficiency and effectiveness. These goals are meant to provide the best for the customer at the least possible cost. Organisations have used technologies such as radio

frequency identification devices (RFID); Electronic data interchange (EDI), smart cards, enterprise resources planning (ERP) and many other instruments to facilitate agility and leanness in the supply chain. These instruments are to make sure that the supply chain delivers to the customer what the customer needs, in an efficient manner whilst also eliminating as much waste as possible in the process (Barve, 2011: 326).

Although some authors discuss lean and agility as opposing concepts, these however do share a common objective which is to meet customer demand at the least cost possible (Hilletoft, 2012: 1276). Jian, et al (2008: 665) states that agility and lean work even better when combined because they offer the best of both worlds that is they offer the benefits of a lean system as well as the benefits of an agile system. Leagile has been accepted as a winning strategy in terms of growing a company and treating each customer in a unique manner and aligning their needs with the appropriate strategy (Ambe, 2010: 7).

The combination of lean and agility in the supply chain is an important source of competitive advantage for any business (Jian, et al, 2008: 6650). Agility has been accepted as a winning strategy for growth in many companies (Ambe, 2010: 7). Malindzak, Mervart and Lernort (2012:134) stipulate three proven ways in which the two concepts have been witnessed catering for all customers in a manner that satisfies them and also saves money for the organisation.

Malindzak et al (2012: 134) discuss the Pareto curve approach which uses the Pareto (80/20) rule. This rule recognises that 80% of a company's revenue is generated from 20% of the products. It also suggests that 20% of the fast moving consumer goods products can be made in a make-to-stock manner and the 80% should be produced in an agile approach, employing more make-to-order approaches, so as to produce items that are made only upon order (Malindzak et al, 2012: 134). Goldsby, Griffis, and Roath (2006) cited in Malindzak, et al (2012: 135) also mention a de-coupling point approach which works on the idea of strategically holding inventories in a generic format and waiting for customer orders to then complete according to the customers' specifications. Most companies utilise lean up to a decoupling point and thereafter use agile methods.

Malindzak et al (2012: 134) also discussed the separation of base and surge demands. The difference between the base demand and the surge demand is that base demand can

be forecasted on the basis of past experiences however, this is not true for the surge demand. Base demand can be met by simply using lean principles and surge demand is provided through more flexible, agile and higher cost processes (Malindzak et al, 2012: 133). The dairy industry needs to forecast for both surge and base demand as some demand can be forecasted from past experiences and some cannot. Below is a discussion of how Information Technology (IT) and its efficiency work in assisting the organisation to become more agile.

2.5 IT efficiencies and agility

Agility is said to be more than a functional capability but a business-wide capability that impacts organisational structures (Gligor and Holcomb, 2012: 442). Gligor and Holcomb (2012: 442) discuss the question of the relationship between IT and agility as being similar to that of the “chicken and the egg” puzzle. It is not clear which one comes first between agility and IT but they are both related and one cannot exist without the other.. It is therefore unclear if the organisation should invest in information technology (IT) so that it may better provide for agility and flexibility purposes or whether the firm should invest in flexible and agile processes prior to investing in IT integration.

Then use of technology makes processed that may have taken longer to be performed in a shorter period of time. Technology can impact firms in many different ways, for example, integrated systems assist by providing the supply chain with information that enables the organisations within the supply chain to deal with their customers in a more agile and personalised manner (Tseng, Wu and Nguyen, 2011: 260). The information provided through the use of different communication channels can also assist in increasing sales volume of the organisation by dealing with customers directly and promptly whenever new products are being introduced (Tseng et al, 2011: 260).

The relationship between agility and IT in an organisation or a supply chain has always been very transparent. This relationship between the two concepts can be seen in White, Daniel and Mohdzains' (2005: 399) definition that states the characteristic of an agile supply chain which all attribute to IT and the use of its tools. The authors state that agile supply chain have been characterised a sustilising sysmest such as ; “the use of virtual teams, having time compressed business processes, communicating real-time

market data via information systems to all parties in the supply chain, , being responsive to changes in throughput, destinations and volumes and the use of de-coupling and postponement points.”

Studies have shown that the larger the extent that parties in a supply chain are connected, the greater the degree of collaboration and coordination. The connection and collaboration then leads to increased chances of success for all the parties in the supply chain White, et al (2005: 399). White, et al (2005: 398) highlight that, even though this is an ideal situation, it does require that the parties be greatly involved, committed and invest a lot of time and effort in such initiatives in order for the results to be fully realised. The problem though, is that, a lot of organisations are usually reluctant to commit to such initiatives. The investment is however, worthwhile since the organisations will forever reap the benefits as long as they are still working together.

IT continues to play a very important role in supply chains since it provides the supply chain with information that makes the organisations in the value chain more robust and also more able to keep or even improve efficiency levels. Most companies are now using IT extensively in an attempt to improve their operations and become competitive in their markets (Tseng et al, 2011: 265). IT has shown its potential to manage information flow and impact many dimensions of the supply chain, including quality, delivery, cost, flexibility and profits for the firms (Tseng et al, 2011: 265).

2.6 The Dairy industry

The dairy industry is considered to be one of the fastest growing industries worldwide. In places such as India, China and California the consumption of milk and milk products has grown considerably among the middle to upper class citizens (Winter, 2010: 5). The dairy industry is a very crucial industry as it produces food items that have essential nutritional values. As society is becoming more and more health conscious the consumption of most of these dairy products continues to rise (Spicka, 2013: 134).

The South African dairy industry produces products such as milk, yoghurt, cheese, ice cream, custard, cream buttermilk and ‘*amasi*’ (fermented milk that tastes like cottage cheese or plain yogurt, which is very popular in South Africa). However, amongst all

of these, fresh milk is known to be the largest selling, potentially most profitable and most cost effective product (Winter, 2010: 7). These products are said to be relatively difficult to market throughout the year since they are fairly seasonal. The peak for these sales is usually the beginning of summer and during holidays, such as Christmas, and during other festive seasons like the Easter holidays (Winter, 2010: 7).

Over the past few years a tremendous growth has been experienced in the dairy industry. In the United States market the efficiencies of these markets have been enhanced through investments in technology and productive assets (Sohail, Austin and Rushdi, 2004: 48). This is something that is also visible in Southern Africa. However, Keyserlin, Martin, Kebrea, and Grant (2013: 112) state that this has not proved to be very easy in developing countries such as South Africa (et al, 2013: 112).

Grant (1995: 36) states that, in the European market, one of the key success factors for players within the dairy industry in the future will be to have the ability to quickly react to change in both local and international markets.

The author also mentions that organisations that will be successful and be able to gain competitive advantage will be organisations that are able to develop and maintain close product control, anticipate and assess local conditions, adopt a positive and dynamic approach to growth and innovatively avoid barriers to growth and develop a competitive environment, which all attributed to agile organisations.

According to nda.agric.za (4:2012) the South African dairy market is divided into 2 broad categories, that is 60% liquid products and 40% which is concentrated products. The major part of the liquid products is fresh milk and the major part of the concentrated products is hard and semi cheese. Most of the dairy product is produced along the coastlines in South Africa because of the warm temperature and good rainfall that ensures good quality of the products produced (nda.agric.za:2012, 4). The diagram below shows the quantities that are produced by the different provinces.

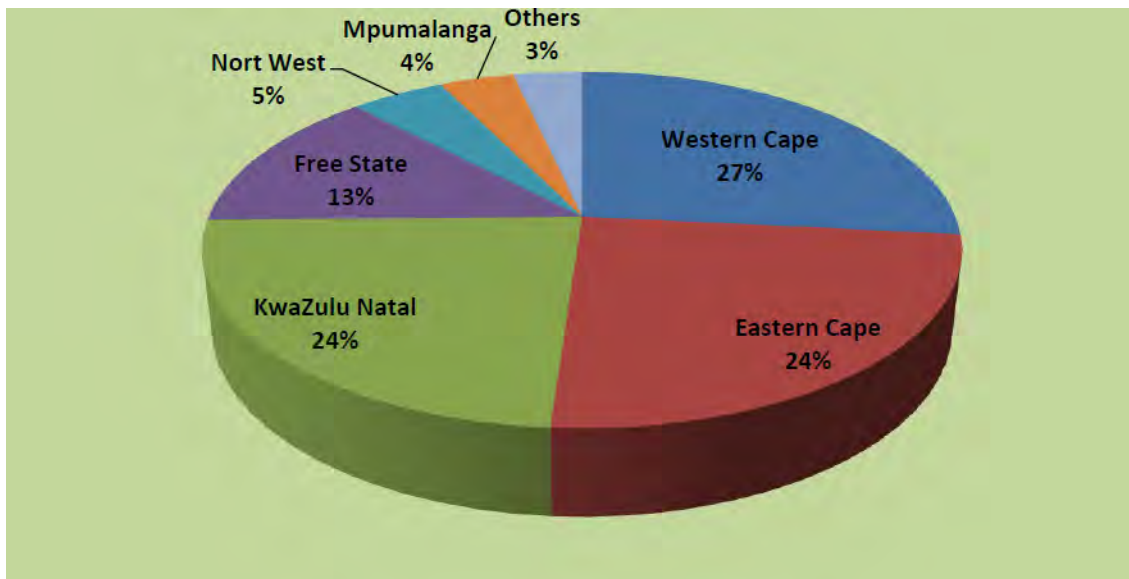


Figure 2.1: Milk production per province

Source: nda.agric.za, 2012: 2

The dairy industry is a major contributor to the South African economy. The industry employs a large number of semi-skilled and skilled personnel. Cows need to be milked every day, twice a day (nda.agric.za:2012: 2).

2.6.1 Challenges faced in the dairy industry

The dairy industry faces challenges that are not uncommon to any other industries. They face challenges such as the increasing competition for water and land as well as their use of energy (Keyserlin, et al, 2011: 112). Cárdenas, Rivera, Sada and Campos (2013: 4) mentioned some of the challenges that are particularly faced by the to the supply chain in the dairy industry. These are issues such as the lack of proper cold chains, lack of skilled and trained workers, lack of infrastructure, gaps in information within the supply chain and demand forecasting (Arriaga, Cardenas, Rivera, and Campos, 2013: 4).

The issue with demand forecasting is that producers of milk tend to exceed or produce below the market demand. Part of this problem of over and under supply is the regular seasonal imbalance as well as an ever-changing global market (Winter, 2010: 5). Given the overall uncertainty in milk demand, the stakeholders in the supply chain tend to overestimate their demand in order to accommodate any uncertain events, which often

leads to the bullwhip effect. Since this overall uncertainty in milk demand is accompanied by ever rising prices of the dairy products, this may result in a tendency by stakeholders throughout the industry's value chain, to overreact to established information (Winter, 2010: 5).

According to Yahia (2010: 1) lack of a proper cold chain (pre-cooling, cold storage, refrigerated storage and refrigerated display in retail shops) and lack of infrastructure are problems that are very common, especially in developing markets. The author goes on to mention that this is a problem that has been experienced in several developing areas. However, areas such as China, Brazil and India have shown recent developments in their maintenance of a cold chain. Most of the other developing countries, including South Africa, still struggle to maintain up-to-standard cold chains.

2.6.2 Possible future developments within the logistics of dairy industry

According to Rysstad and Kolstad (2006: 86) there have been a number of developments within the dairy industry in the past few years. One of the key trends, worldwide, is the widening range of products available to consumers. This is true for both developed and developing countries such as South Africa and New Zealand (nda.agric.za:2012, 5).

There are also continuous improvements in the logistics sector. These have been implemented in order to accommodate changes in industries such as the dairy industry. These developments have contributed to an increase in the quality of cold chains, distribution methods, and improvement in process machinery such as filling machinery and packaging materials (Rysstad and Kolstad, 2006: 86). These changes are known to have assisted in extending the shelf life of these perishable items.

Technological advancement has contributed substantially to developments within the industry. The industry is expecting to see more improvements in areas such as demand forecast accuracy. Data accuracy will be given more attention in the near future in the quest to achieve more accurate orders. Data accuracy is very important as it is one of the important factors that guide the entire performance of a supply chain. (Arriaga et al, 2013: 2).

Other technological advancements that this industry is yet to enjoy are greenhouse emissions control devices. These can be used companywide from the top level of management to lower levels of supervision. The use of wireless communications can feed information such as the climate inside and outside the green house (Wang, Zhang and Wang, 2006: 8). The use of RFID devices in food packaging as well as more sophisticated food inspection is also a growing trend within the agricultural sector. This is done for purposes of food safety and traceability. The concepts of smart packaging, smart appliances and smart recycling are ones that are constantly growing in this industry. The improvements that are expected to come with these devices are believed to increase security, inventory control and traceability that are meant to result in cost savings (Chanler, 2003: 257). Some of these activities may be performed by in-house logistics departments and some can be outsourced to 3PLs; below is a description of 3PLs and how they can be used in the dairy industry.

2.7 Third party logistics providers (3PLs)

The increasing demand by a large range of firms to be efficient in their operations and to focus on their core business has resulted in a rapidly developing market for 3PLs (Farahani, Rezapour and Kardar, 2011: 90). With markets constantly changing, with organisations changing and with the increasing need to use technology more efficiently, 3PLs are also required to keep up with the changes in order to be more efficient in their operations. This is ingrained in the definition of supply chain management, which Hsiao, Kemp, Vorst and Odcmta (2009: 114) define supply chain management as “the design and management of seamless, value-added processes across organisational boundaries to meet the real needs of the customer”. The idea behind any supply chain is to share the same goals and resources and to have collaboration with all the parties in the entire supply chain. This is done in order to achieve the ultimate goal of customer satisfaction.

Outsourcing some or all of the logistics activities is useful in the agricultural and food manufacturing industry. This was elaborated on a study conducted by Beulens (2002), cited in Hsiao, et al (2009: 114). The study revealed items that are likely to complicate a food manufacturer’s logistics processes. The items listed were distribution channel complexity, distribution complexity and demand complexity (Hsiao et al, 2009: 114). Therefore, operations are made simpler for the participants in the agricultural sector if

such non-core activities are outsourced to 3PLs. The 3PLs have since modified in order to be able to deal with these complexities. Most 3PLs have since moved from operating with just a lean strategy to operating according to agile or leagile strategies (Matthias, 2007: 423; Reijns, 2010: 11).

2.7.1 The implementation of lean by 3PLs and the benefits

Typically 3PLs provide basic services such as lean warehousing, transportation and packaging (Li, 2014: 1). These activities assist clients to be more responsive towards customers, to reduce costs, minimise inventory and improve customer satisfaction. An organisation that uses a lean strategy derives considerable benefits when working with a 3PL that is also lean in its operations because they work together with a common goal which is to provide the best for the customer at the lowest cost possible (Malindzak, et al, 2010: 133).

Lean is known to be a very good strategy for dealing with standard products that are very low in variety and products that are produced in large quantities (Konecka, 2010: 25). The 3PLs can easily use the lean approach with these types of products and therefore achieve economies of scale that contribute to cost reduction (Konecka, 2010: 25). From this point of view, lean would appear to be the perfect strategy for the dairy industry, yet the perishable nature of these products and the ever changing preferences of the market may prove otherwise. According to Luckin (2012: 95) the application of lean generally assists the company to service its customers faster, using less space and inventory. It also assists with improving the accuracy of transactions at very low costs.

Wee and Wu (2009: 59) identified six prominent lean attributes that contribute positively to any organisation. These attributes are demand management ability, waste and cost reduction, process and product standardisation, industry standards adoption, cultural change competency, as well as cross-enterprise collaboration. When these lean attributes have been adopted, the supply chain is in a better position to achieve its lean objectives of inventory reduction, improved responsiveness to demand fluctuations, increased market share, closer integration with suppliers and customers as well as higher levels of customer satisfaction (Mohammed et al, 2008: 341).

2.7.2 Agility for 3PLs and dairy farmers

Arriaga et al. (2013: 2) stipulate that it is very important for firms to use the appropriate agile strategies in order to compete successfully. Mohammed et al. (2008: 341) explains that managers of supply chains need to be able to identify trends in the markets that they operate in, in order for them to determine the appropriate strategies to implement. Ideally, supply chains that are volatile and sell innovative and dynamic products require the supply chain to be more agile than anything else (Reijns, 2010: 11). The agile value system defined focuses on efficient and flexible responses to unique customers' needs and this is what agile companies, working together with agile 3PLs, need to focus on.

The agile system usually uses a make-to-order strategy, which is a "wait-and-see" approach that instead of relying on what the demand is likely to be relies on exactly what customers want (Mohammed et al, 2008: 341). Manufacturers have to make sure that upon receiving orders they service their customers as soon as possible, despite having to perhaps add some features to complete the items. In such cases lead time reduction must always be considered because it impacts time to market. Lead time consideration and reduction is necessary so that the organisation is able to service its customers in the shortest time possible (Childerhouse and Towill, 2000: 205).

Dairy farmers look for logistics solutions that can assist them to reach their customers quickly, with short turnaround times and with the required products delivered in the desired state and quantity. This is very important within the dairy industry since dairy products have a very short life span. In turn, the highly perishable nature of the products requires 3PLs to be very sensitive and agile when dealing with this industry (Piment, 2010: 53). According to Kritchanchai (2004: 384) the fast moving consumer goods market has now become a leader in the consumer market and this has resulted in the largest retailers expecting greater flexibility and responsiveness from their dairy suppliers. Suppliers need to be agile, alert and able to accurately forecast demand. They should be responsive to the changes in the market and ensure an adequate supply of products (Kritchanchai, 2004: 384).

Increasingly, it has also become very important for enterprises, such as those in the dairy industry, to have agile strategies that help them achieve a competitive advantage.

Efficient and agile logistic services are valuable in these industries, as their commodity-like products have comparatively few differentiating features that can make them stand out from their competitors (Keyserlingk, et al, 2013: 5411).

2.8 Supply chain management and 3PLs

According to Hilletofth (2012: 1276) supply chains differ in the manner in which they operate. There are supply chains that focus primarily on simply creating effective and lean value chains and there are those that focus on agile supply chains that are mostly efficient and responsive. Both these supply chain designs are not ideal in isolation. A lean supply chain runs the risk of not being able to meet exact customer demands. An agile supply chain on the other hand runs the risk of a low efficiency rate and high unit costs (Hilletofth, 2012: 1276).

Before they approach their suppliers, retailers and even service providers, such as 3PLs, must recognise the requirements of their markets in order to design appropriate supply chains that cater for their customers' unique needs. For example, a lean supplier, when dealing with a manufacturer who is focused on an agile philosophy, would need to customize his services to accommodate the agile manufacturer. Similarly, suppliers and manufacturers would have to adapt to the needs of the retailers that they deal with. This will assist firms to select an appropriate supply chain that complements the type of products that they produce and the type of customers that they can cater for (Hilletofth, 2012: 1276).

According to Arriaga et al. (2013: 2) a supply chain consists of parties that are directly and indirectly involved in the quest to satisfy customers. Hsiao et al. (2009: 116) emphasises that by definition the supply chain does not only consider raw material suppliers and manufactures but also includes warehouses, retailers, transporters and customers. The idea is to have the same goals, to share ideas, share resources and to collaborate throughout the supply chain. Parties in the supply chain work to complement one another and to assist other organisations to achieve their goals, whilst also benefitting themselves from the process (Kumar, 2014: 19).

Gligor and Holcomb (2012: 438) state that effective 3PLs can go to great lengths to assist agile firms by collaborating with other value chain partners in order to meet

unpredictable demands of final customers. An example would be an organisation that produces goods or services and uses a 3PL for the required logistics services, which the organisation is not competent to provide or has found to be too expensive to perform in-house. The act of outsourcing allows the producer to focus on his core business and the 3PL to focus solely on providing logistics activities (Fawcett et al., 2007: 61). By working together organisations in the supply chain can assist one another to reach the ultimate goal of efficient and effective customer satisfaction.

The overall aim of a supply chain is to add final customer value to a product at each stage in that supply chain. A multiple regression analysis based on a dairy industry supply chain (Kumar, 2014: 19) indicated that out of seventeen variables considered in the study, nine variables were important factors in enhancing the supply chain. These included distance/proximity, quality of milk, the transport service, distribution channel system, milk collection centres, information systems, volume of milk production, management commitment and warehousing (most of which can be provided by 3PL services).

Barve (2011: 325) states that 3PLs do not only provide their clients with a wide variety of services but they also provide them with expertise such as market knowledge, data access, improved operational efficiency, flexibility, customer service and the ability to focus on their core competency. However, Green, Turner, Roberts, Nagendra and Wininger (2008: 10) claim that most 3PLs still only offer basic services such as inventory management, shipment tracking and tracing, logistics management and consulting, freight auditing and reverse logistics. This is limiting as nowadays supply chains are expected to be more versatile and to adapt quickly to both expected and unexpected changes in the market (Gligor and Holcomb, 2012: 438). Crucially, every supply chain should be designed with sufficient market knowledge because supply chains that are designed without taking careful regard of the market may result in a complete failure (Faisal, et al., 2006: 879).

2.8.1 The selection of 3PLs

Organisations may avoid choosing certain 3PLs on the basis that they are only able to provide basic logistics services. A variety of factors may be considered; an important factor may be the extent to which a 3PL can provide a source of competitive advantage.

Other aspects that organisations may consider are the levels of flexibility, the potential improvement in customer service levels, improved IT systems and the operational efficiencies that 3PLs can provide (Catay, 2007: 379). A number of authors have mentioned 3PLs as a potential source of competitive advantage and this has become a new central factor that many organisations look for when selecting a 3PL. Logistics service providers are also now evaluated on their ability to offer quality services to their customers (Banomyong and Supatn, 2011: 420).

Banomyong and Supatn (2011: 421) have highlighted five main steps that are involved in the selection of 3PLs:

1. The organisation needs to identify the need to outsource logistics.
2. The organisation needs to develop a list of feasible alternatives by using internal expertise, experience and knowledge to hire outside experts and get hold of professional logistics services.
3. The organisation needs to evaluate candidates and select a suitable service provider.
4. After the suitable service provider has been selected, the services need to be provided
5. Service evaluation and control performance is the last step that is performed in order to improve the existing relationship or to change the service provider.

The authors go on to state that it is crucial that the steps in choosing an appropriate 3PL are followed because the selected 3PL has a direct impact on the company's logistics channels as well as its efficiencies (Banomyong and Supatn, 2011: 421).

According to Catay (2007: 381) relationships are very important and both organisations and their 3PLs need to make sure that they maintain healthy relationships between themselves and the other parties in the supply chain. This can be achieved by stating and clearly defining at the beginning of the agreement the logistics functions and the levels of efficiency and responsiveness that are expected. This will also assist in creating criteria for evaluation that can be communicated within the organisation and the 3PLs.

Catay (2007: 381) also described how integration, optimisation, operations and performance are some of the main factors that most companies look for when selecting 3PLs. Other factors that organisations look for in 3PLs include capabilities such as IT integration, load optimisation, fixed/variable route planning, on-time shipment, optimum daily vehicle planning, and reliability of shipments, documentation and transportation, quality, supporting continuous improvement plans, assurance in loading, urgency planning and many more (Catay, 2007: 381). Banomyong and Supatn (2011: 420) state that a 3PL that is able to offer higher service levels, such as the ones mentioned above, should also be able to provide its clients with benefits such as a reduction in the client's operational costs, logistics lead times and increased service levels.

A topical issue at present and one seemingly that will remain a future trend too, demands that companies be environmentally friendly and have environmentally friendly supply chains. However, environmentally friendly supply chains are a challenge because it is not an easy task to control the activities of all the members in the supply chain (Chan, He, Chan and Wang, 2012: 628). Organisations should try and ensure, during the process of selecting their partners in the supply chain, that they select partners that adhere to required standards regarding the use of environmental friendly products and ways of doing business (Perotti, Zorzin, Micheli, 2012: 645). A challenge for most organisations trying to maintain good environmental performances is that they have to pay premium prices to do so. This presents a further challenge since most organisations are trying to save costs as much as possible (Perotti et al., 2012: 645).

2.9 Benefits of using 3PLs in the dairy industry

Research conducted by Hsiao et al. (2009: 83) discovered that the manufacturers of chilled food items are more service-driven than those of other food categories. This means that the dairy industry is more likely to put pressure on the 3PLs than other industries. Gilgor and Holcomb (2012: 439) suggest some indirect benefits that the dairy industry may gain from using 3PLs. These include being able to focus on the company's core function which results in increased operational efficiency and effectiveness as well as enhanced customer value.

In a study done by Green et al. (2008: 11) it was evident that most 3PL clients seek logistics providers that will be able to provide them with the necessary exposure locally and internationally, as well as those that will offer solutions to new and day-to-day challenges.

Any business, big or small, can benefit from 3PLs. According to Green et al. (2008: 11) smaller companies can benefit from the amount of knowledge and experience that 3PLs have. However, larger organisations benefit from the freedom to focus on their core operations without being distracted by the logistics challenges that their many different plant locations may create. They can rely completely on 3PLs to take control of their logistics services. Lastly, Green et al. (2008: 11) deduced from the results of their study that it is crucial to identify whether or not the chosen 3PL can provide the necessary solutions that match the company's challenges, as this is the greatest contributor to the success or failure of the partnership (Green et al., 2008: 11).

Nowadays, supply chains attempt to improve levels of customer service by taking advantage of outsourcing and using entities such as 3PLs to capitalise on their capabilities (Faisal, et al., 2006: 879). This is because of the constant changes in markets and customers that are becoming more and more difficult to generalise. Organisations are finding it difficult to manage the various products and quantities and hence they need the assistance of entities such as 3PLs (Faisal, et al., 2006: 879).

Nevertheless, outsourcing is not all favourable as any form of outsourcing introduces challenges to the company, such as loss of control and loss of customer contact. However, this disadvantage is usually offset by the knowledge and expertise that the logistics focused businesses offers to its client organisations (Hsiao, 2009: 84). An important consideration is that the benefits that are derived from 3PLs may be worth more than previously. This results from the evolving role of 3PLs. The focus of 3PLs is no longer just on cost reduction and moving products from point A to point B. The focus now is mainly on strategic influence in terms of market coverage, service improvement and increasing flexibility (Evangelista, Sweeney, Ferruzzi and Carrasco, 2010: 2). Figure 2.1 highlights the advantages and disadvantages of using 3PLs, as discussed in this section.

Table 2.1 Summary of the advantages and disadvantages of using 3PLs.

Advantages	Disadvantages
Improved efficiency, service and flexibility	Impact on in-house workforce
Focus on core competency	Loss of control over the logistics function
Freeing up resources	More distance from clients- loss of personal touch
Elimination of infrastructure resources	Discontinuity of services of a 3PL provider
Risk- sharing	Differences of opinion or perception of the service level of the 3PL provider
Better cash flow	Access to resources not available in one's own organisation

Source: Green et al., 2008: 10

2.10 Conclusion

In conclusion, every organisation constantly seeks ways to improve its operations. The objective could be to produce the same amount of product in less time or at lower cost, or it could be to increase variety and increase customer service levels. This is evidenced by the increased use of strategies such as lean, agile, leagile and JIT in organisations. The dairy industry, because of the perishable nature of its goods and also because it currently has demanding customers, has to substantially improve the way in which it conducts its business. Some of the improvements could involve moving from a lean production system to a more agile one that better caters for customers' needs. However, the dairy companies do not operate in isolation. The other stakeholders have to be integrated with the dairy manufacturer or supplier's strategy in order for the products to move efficiently within the supply chain. This is done so that they reach the customers in the right place, at the right time and in the desired condition.

CHAPTER 3: THE LOGISTICS ACTIVITIES

3.1 Introduction

Logistics is described as one of the most important functions in many organisations; more especially organisations that produce tangible products. Without logistics, products would not reach customers in the desired state, place and time. There are 13 basic logistics activities that most organisations conduct. These are transportation, warehousing, customer service, order processing, demand forecasting, inventory management, packaging, reverse logistics, procurement, materials handling, logistics communications, parts and service support and plant warehouse site selection (Vogt, Piennar and De Wit, 2006: 6).

This chapter will consider only the first eight logistics activities mentioned above. The literature review will consider how these logistics activities work together to ensure that customers receive their products in a timely manner and in the desired condition. It will also consider how lean, agile or leagile logistics can be implemented by 3PLs in order to support a manufacturer's goal of achieving a lean, agile or leagile supply chain.

Figure 3.1 depicts a model that explains how agile manufacturing and agile logistics can work together to achieve an agile supply chain that delivers increased levels of customer satisfaction. Customer satisfaction is achieved by delivering to customers exactly what they need, when they need it. The diagram also highlights the key strategies and tools that an agile organisation and its logistics department or a 3PL can deploy in order to achieve agility and efficiency.

The figure shows that the parties that are involved in making and delivering the products to the final customers have to be fully integrated in terms of the programs that they implement and the actions that they take. The principles that guide their actions should also be aligned (Christopher and Towill, 2001: 234). This is very important because, for example, if the manufacturing department is highly efficient but the logistics department is not, the partial efficiency is just a waste of time, money and effort. The converse holds true too.

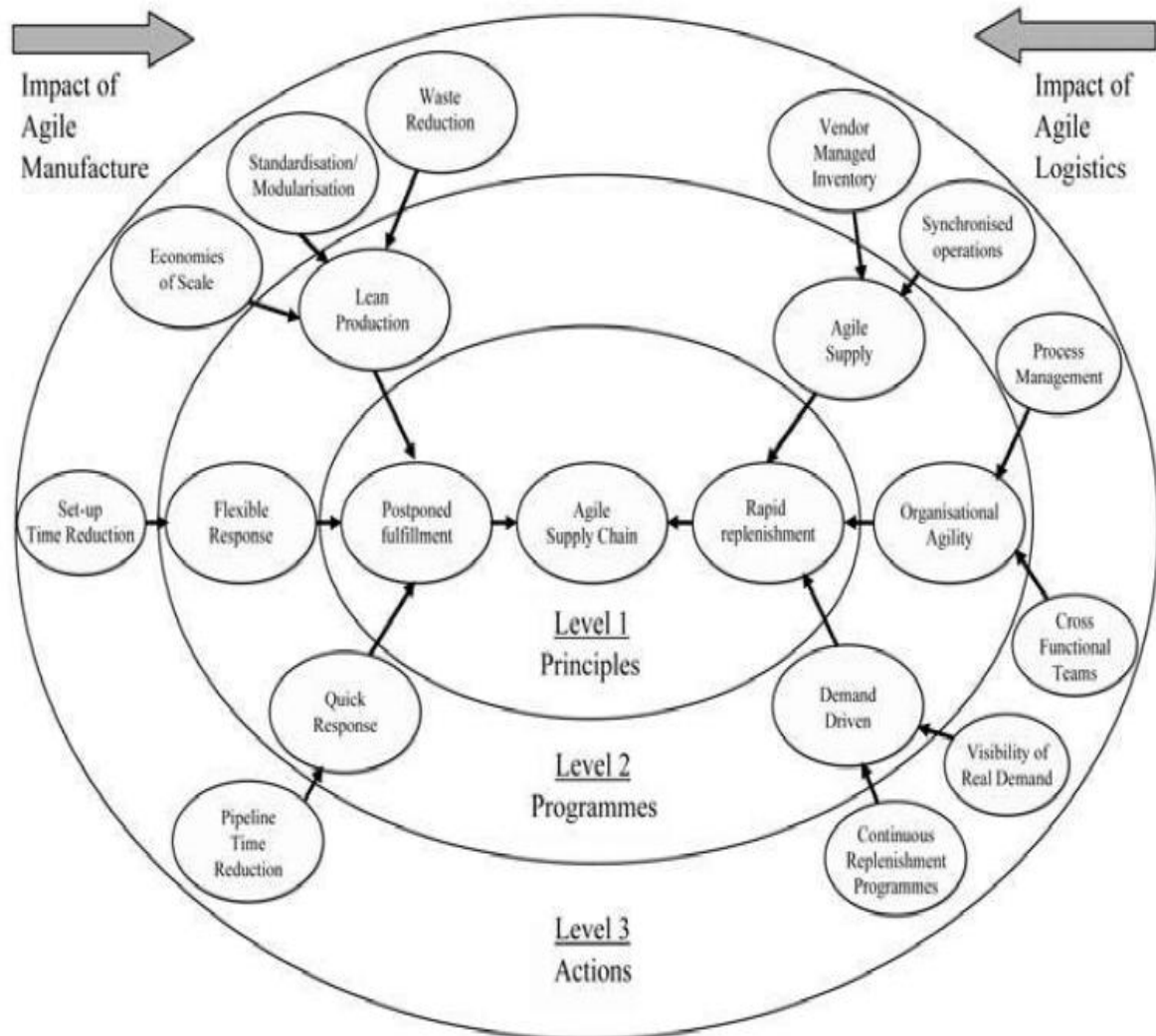


Figure 3.1 An integrated model for enabling agile supply chain

Source: Christopher and Towill, 2001: 234

3.2 The role of logistics

According to Tseng, et al (2005: 267) ‘Logistics was initially a military activity concerned with getting soldiers and munitions to the battlefield in time for fighting, but it is now seen as an integral part of the modern production process.’ Recent definitions have defined logistics as the process of handling and moving products and materials from where they are sourced, to production, sales, consumption and finally waste

disposal (Tseng et al., 2005: 267). Tseng et al. (2005: 267) and Shang and Marlow (2004: 218) agree that not only is logistics concerned with the moving of products in the supply chain, but it is also a source of competitive advantage. Most organisations now use logistics as a strategic force operationally both within and outside the organisation.

The basic role of logistics in the 21st century is to increase the mobility of goods and services, thereby also adding more value to the products as they move closer to the final customer. Some of the logistics activities are performed in-house by organisations; yet most of these can be outsourced to 3PLs.

3.2.1 Logistics and Information Technology

Logistics service providers need to introduce a number of technologies that can assist them to cope with today's customer expectations and the level of efficiency that their clients require from them. Technologies such as Radio Frequency Identification Devices (RFIDs), Quality Oriented Tracking and Tracing Systems (QOTT), first-in-first out (FIFO), Safety monitoring and Assurance systems (SMAS), Electronic Data Interchange (EDI) and other freight tracking devices are reported to be some of the very useful technologies that contribute to an efficient and effective supply chain (Kumar, 211: 341; Crainic, Gendreau and Potvin, 2009: 542). These technologies also assist organisations to be better able to deal with uncertainties in the environment (Tseng et al., 2001: 268).

Making use of available technologies in the storage and transportation of products aids faster, more flexible and more responsive deliveries. Technologies such as electronic point of sale (EPOS), computer-aided design (CAD), computer-aided manufacturing (CAM) and EDI are available to enable supply chains to become more efficient (Birtwistle, Fiorito and Moore, 2006: 336). However, research conducted by Christopher, Lowson and Peck (2004: 373), alluded to the fact that the mere implementation of technology in any organisation or supply chain without any strategic underpinning is likely to lead to a less than desirable state of performance. Therefore, to be able to reap the benefits of available technologies, organisations in a supply chain need to plan properly and adopt appropriate strategies.

Stefansson and Lumsden (2010: 55) described a framework for logistics systems which entails using more data and information to overcome some of the shortcomings that are found in certain logistics companies and logistics departments. This was referred to as “smart intelligence”. The idea of smart freight concepts have also been developed from “smart intelligence”, as well as “Smart Logistics Setup” (Lumsden, 2010: 55). Smart Intelligence and Smart Logistics Setup are basically automated settings and movements that are able to self-organise transportation routes locally, as well as across continents and oceans to their destination (Mckelvey, Wycisk and Hulsman, 2009: 476).

Smart freight is the ability of an organisation or a 3PL company to use available technologies to do business in a faster and smarter way. Smart freight has the ability to retain and store data about the organisation, to process unique identities, to display schedules and production requirements and it has the ability to support local decision making (Lumsden, 2008: 57). In order for smart freight to function, it needs products to have RFID tags or barcodes attached so that data may be collected and sent to the backbone system that is integrated with an ERP system (Lumsden, 2008: 57).

Smart freight relies on advanced technologies to operate. This initiative requires large amounts of information sharing, technology and equipment such as RFID tags, or other similar reading technologies and a backbone system such as Enterprise Resources Planning (ERP). A system needs to be in place to store the data (Stefansson and Lumsden, 2010: 55). All these developments are made to increase the efficiency levels of logistics and to be agile in meeting the supply chain customers’ needs.

3.3 Transportation

Transportation management is a fundamental activity for any company that produces tangible products that need to be transported from point A to point B. Transportation helps to ensure that the right products are delivered to the designated place, at the appropriate time, in the required condition and quantity and at an acceptable price to the customer (Vogt et al., 2006: 224). The activity of transporting goods is said to be the key component in supply chain management (SCM) and should be treated as one of the fundamental activities in the organisation. Huq, Stafford, Bhutta and Kanungo (2010: 270) contend that even though transportation is recognised as one of the most important

functions of SCM and is considered a strategic resource, it is sometimes excluded in critical strategic planning processes by organisations.

In South Africa the most common modes of transport are road, rail and sea transport systems. According to (Henderson, no date) “about 89 percent of South Africa’s freight is transported by road”. This indicates the dominance of road transport in South Africa. One can assume that the reason why this mode of transport is the most popular within the country is because of its availability, accessibility and convenience. Other factors that are considered by most organisations when selecting a certain mode of transport are the route capacity, frequency, flexibility, cost of using the particular mode, and other service factors, such as delays, reliability, damage avoidance and loss (Pedersen and Gray, 1998: 112). Road transportation in the South African context seems to meet most of the above mentioned criteria and it is therefore not surprising that it is the most used mode of transport

Using road transport affords firms, such as those in the dairy industry, with benefits such as frequency, convenience and flexibility, cost reduction, minimum delays and reliability. In the case of South Africa, road transport is considered the most convenient because of the availability of infrastructure (Henderson, no date). In order for organisations within the supply chain to inherit benefits, such as a competitive advantage, associated with using certain modes of transport, the transportation system and necessary infrastructure, must be well developed (Tseng et al., 2005: 260). Good quality infrastructure can assist logistics departments and 3PLs to obtain other benefits such as reduction in operating cost and promotion of service quality (Mansouri et al., 2011: 142). The quality of transport services offered by 3PLs is one of the important factors that organisations look for when selecting a particular carrier. The quality of transportation, according to Larsson and Kohn (2012: 39), refers to service reliability, quality, order visibility and speed.

It is important for any transportation system or 3PL to be aligned with the strategies of the organisation that they provide services for. For example, since dairy products are perishable in nature and need to be shipped within the shortest possible time and at the lowest possible cost, a fast, flexible, agile (or leagile) and responsive mode of transport is desirable for such products. Having an agile mode of transport can assist an

organisation to be able to connect timeously with other organisations in the supply chain and with the final customers (Mansouri et al., 2011: 142).

Road transportation provides agile enterprises with a lot of flexibility for both big and smaller loads. Long haul trucks are usually used for bigger loads but smaller trucks or even “bakkies” are used to transport smaller loads. This is done so that the organisation can enjoy economies of scale with the bigger loads and with smaller loads this assists the organisation to minimise costs by not transporting “air” (Vogt et al., 2006: 224). This also contributes to greater efficiency, flexibility and responsiveness to smaller orders that may be required by customers. Such flexibility is something that would be impossible with other modes of transport, such as air and rail transport. Air transportation is too expensive, relative to the value of the dairy products; the rail is too slow, is not very flexible and is inconvenient (Bowersox, Closs and Cooper, 2002: 178).

3.4 Warehousing

Warehousing is described by Gunasekaran, Marri and Menci (1999: 328) as a process that includes storage and retrieval operations, organisational aspects, machinery for materials handling, media for material storage as well as the actual building that contains and protects the products being stored. Warehousing is one of the few logistics activities that organisations usually outsource to 3PLs in order that they don’t directly incur the costs that are associated with the ownership of the warehouse. These include costs such as rates, rent, insurance, water and electricity, storage costs, operational costs, administrative costs and many other hidden costs such as delays (Speh, 2009: 1).

In a typical warehouse, products are stored in a particular order for easy accessibility and for efficiency in the work place. Items may be randomly assigned or similar items may be grouped together in the same area. Others may be stored based on their order or picking volume (Petersen II, 1999: 153).

Volume storage is an act of assigning storage locations based on the expected volume; this type of storage is usually used by many organisations and has been considered as the most efficient form of storage. In this strategy high volume items (in terms of the number of orders received for that particular product) are located closer to the picking point (Petersen II, 1999:153). To achieve any efficiency in the warehouse it is crucial

for warehouse management to be aware of the location of certain products. A typical warehouse has six major activities, i.e. receiving, storage, handling, transfer, packaging and expediting. Storage however, is typically thought of as the fundamental activity of warehouse operations (Gunasekaran, Marri and Menci, 1999: 329). Gunasekaran, et al. (1999: 328) also state that inventory control, production control and warehouse management are some of the other major activities that affect industrial success in terms of efficient product distribution.

An efficient warehousing system needs a large amount of information sharing and transparency and it requires efficient media and technologies to store and handle data about the movements of products (Connolly, 2008: 109). Technologies such as RFIDs and EDI have been used by warehouse managers in order to access, store and share information in their warehouses. Managers also use such technologies to make sure that there is correct stock within the warehouse, that no unnecessary money is tied-up in inventory, that the products in the warehouse are properly kept, and that the warehouse capacity is both economical and efficient (Gunasekaran et al., 1999: 328).

To facilitate transparency, information sharing and easy access to information there are different labels and information readers such as bar codes, RFIDs and rugged handheld computers with sophisticated interfacing capabilities that can be used. Tools such as bar codes and RFID scanners can also be placed at the exit and entrance to warehouses in order to keep track of what is going in and out of the warehouse. This then gives warehouse managers real time, accurate information about what is in stock and what is not (Connolly, 2008: 108).

Many firms have invested heavily in their warehouses in order to be able to achieve the levels of efficiency and agility that they require. Some of these developments include warehouse automation. Warehouse automation is described as ‘The direct control of handling equipment producing movement and storage of loads without the need for operators or drivers’ (Rowley, 2000: 38, cited in Baker and Halim, 2007: 129). Warehouse automation uses equipment such as automated guided vehicles (AVGs), conveyor sorting systems and automated storage and retrieval system for efficiency. Removing manpower and letting vehicles operate on their own can add to the level of efficiency in an organisation since the machines can operate by themselves at any time

of the day. This assists in reducing the inconvenience of hiring more staff or over-working current staff members by requiring them to work overtime.

Enterprises in the perishable goods industry do not usually use traditional warehousing like other organisations; they opt to use another strategy which is considered to provide greater efficiency. This strategy is known cross-docking (Agustina, Lee and Piplani, 2014: 31)

3.4.1 Cross -docking

Cross-docking is a process of moving products through the distribution centre. The only difference from traditional warehousing is that these products are not stored within a typical warehouse. With the cross-dock system, products move from receiving to shipping with little or no storage at all. In a traditional warehouse, products move from receiving to storage and then to shipping (Apte and Viswanathan, 2000: 292).

According to Wooyeon and Egbelu (2007: 376), in cross-docking, products are delivered by inbound trucks with these products then immediately sorted and reorganised according to customer orders and put into other outbound trucks for deliveries to the different customers in different places. Cross-docking is really ideal for dairy products since they are perishable and require an agile supply chain. Such products cannot afford to be stored in warehouses not even for a few minutes. The less time they are kept within the warehouse, the better (Agustina, Lee and Piplani, 2014: 31). Cross-docking is carried out with little or no inventory being stored inside the warehouse; if any material is stored in the warehouse it is for a very short period, generally less than 14 hours (Wooyeon and Egbelu, 2007: 376).

Nowadays organisations are feeling more and more pressure to satisfy complicated customer demands. Consequently, this makes organisations feel the need to have high levels of flexibility, agility and reliability, and hence the need for cross docking (Lee, Jung and Lee, 2006, 247). Cross-docking gains the organisation more than just agility since it also provides the supply chain with cost reduction opportunities. The cost reduction is achieved through the removal of costly activities such as storage and retrieval activities (Lee et al., 2006: 247).

Most organisations do not use a pure cross docking strategy; they usually use a mixed strategy that uses cross docking for certain items and traditional warehousing for other items where some inventory is kept within the warehouse (Apte and Viswanathan, 2000: 296). Wooyeon and Egbelu (2008: 379) state that the main advantages that cross-docking provides include increased inventory turnover (decreased inventory on hand), increased customer responsiveness and a more effective and efficient distribution system. Lastly, the author mentions that in order to have a smooth running cross-docking system, products must arrive at the same time so that there are no items that have to wait for others (Lee et al., 2006: 248).

3.5 Customer service

Customer service, in a logistics sense, is described as the integrated series of activities between a buyer, a supplier and sometimes a third party service provider that augments the sale and increases the utility of the supplier's product from the buyer's perspective (Vogt, Pienaar and de Wit, 2006: 23).

In different organisations customer service is defined in different forms i.e. it can be defined by one company as an activity, another may describe it as a performance measurer, yet others may describe it as a company's strategic element (Naoui, 2014: 790).

Jeong and Hong (2006: 578) support Naoui's statement that the manner in which customer service is described varies from one organisation to another. Customer service relates to a process that is made up of three activity levels i.e. pre-transaction, transaction and post transaction. This means that organisations must be prepared to provide good customer service before engaging with the customer, during engagement with the customer and after the sale has been made; the organisation must make sure that the customer is still taken good care of. The organisation is expected to also have facilities that are designed to cater for customers' aftersales experience (Kotler and Keller, 2011: 377).

Firms that are customer focused and provide the best service for their customers seem to achieve higher outcomes than those that are less focused on customer service (Jeong and Hong, 2006: 578). The level of importance that has been attached to customer

service is justified by most organisations as necessary because of the increasingly competitive nature of today's markets (Naoui, 2014: 787). This illustrates how good customer service and agility should never be separated. A focus on customers and agility is a favourable characteristic of an organisation. These two are difficult to separate since part of the definition of agility includes being customer focused and obtaining competitiveness which is also the goal of good customer service.

Customers have changed the way they perceive quality; nowadays customer service heads the list when customers describe what they perceive to be quality (Jeong and Hong, 2006: 578). A number of observations have also shown that products offer very little product differentiation as compared with customer service. Organisations generally have more to gain when focusing on customer service compared to when focusing on product differentiation (Naoui, 2014: 787). Effective customer service requires that an organisation or a supply chain be alert, focused and know what customers want all the time. This corresponds with agility.

3.5.1 Logistics customer service

Customer service in the logistics sector has become so important that many organisations, including 3PLs, are reviewing their value propositions in order to increase their competencies to offer the best services. This activity also assists organisations to ensure that they are well equipped to cater for their customers' needs (Tian, Ellinger and Chen, 2010: 357). A distinction may be made between "general" marketing customer service activities and customer service in a logistics context. The focus of logistics customer services is to provide time, place, quantity and form utility by ensuring that the product is delivered at the right time to the right place in the correct quantity and in perfect condition for consumption by the customer.

Customer logistics services represent different values in different organisations; one organisation may place more value on product availability and focus on ensuring that whatever product a customer orders it is available in the desired quantity and specifications. In another organisation the focus may be on providing customers with the freedom to place orders whenever they desire and as often as they want (Heskett, 1994: 4). One may assume that the value placed on different aspects of logistics associated customer service is influenced largely by the type of industry the enterprise

operates in and the nature of the customers who are targeted. Essentially, the seven R's of customer service are important.

According to Leuschner, Charvet, Rogers (2013: 47) the seven R's are the backbone of logistics customer service. The seven Rs describe the ability of an organisation to deliver the right product in the right amount, to the right place, at the right time, for the right customer in the right condition at the right price. However, there are other important aspects over and above the seven R's that pertain to logistics customer service; these include service variety, continuous improvement, information availability and responsiveness (Tian, Ellinger, Chen, 2010: 357).

The definition of agility by Matwale et al (2012: 1) regards agility as the capability of an organisation to respond quickly to different customer demands in an efficient manner. This definition indicates that agility and logistics customer service are closely related and seek to achieve similar goals.

Organisations that are able to meet every aspect of customer service may be expected to increase their customers' overall satisfaction, which will, in turn, improve the overall performance of the organisation (Steven, Dong and Dresner, 2012: 43). A widely cited model (Bowersox et al., 2002: 52; Kotler and Keller, 2011: 377) is used by organisations to assess and improve upon their quality of customer service. This model is named SERVQUAL (short for service quality). SERVQUAL is a model that assists organisations to determine their service standards as compared to their customers' expected standards. The model includes five dimensions of service quality standards i.e. reliability, responsiveness, assurance, empathy and tangibles (Kotler and Keller, 2011: 377). These SERVQUAL dimensions have been acknowledged as very good tools that customers can also use to assess their provider's logistics service performance (Leuschner, Charvet and Rogers, 2013: 47).

The SERVQUAL model assists customers to evaluate the value of the services offered, the provider's willingness to provide prompt services for customers, the level of knowledge of the provider and the courtesy that is shown to customers. The results that customers derive from this assessment usually are a reflection of the level of trust and confidence that customers have in the organisation's logistics service offerings (Bowersox et al., 2002: 52). Even the appearance of the physical environment and the

facilities that are used to render the service are relevant when customers assess logistics customer service levels of their suppliers or the 3PLs that they are using (Bowersox et al., 2002: 52).

For service organisations such as 3PLs the overall assessment of customer logistics services includes ‘attributes such as fill rate, order completion, cycle time consistency, cycle time length, on-time-delivery, frequency of deliveries, communication of problems/changes, invoice accuracy, advance shipping notices, preferred carriers and willingness to customize service’ (Leuschner, Charvet, Rogers, 2013: 49). Some of these attributes cannot easily be found in an organisation that is not agile or leagile. Focusing on lean rather than agile may deprive the 3PL and its customers of some of these benefits. For example, it is not easy for a 3PL that is fully focused on lean to be able to provide frequent deliveries or to have short cycle times and also provide customised services. Providing frequent deliveries can be a very difficult task for lean 3PLs because of the nature of lean which seeks to minimise cost by obtaining economies of scale. A lean 3PL always looks at consolidating shipments and this means waiting for other organisations to place their orders so that they may deliver everything together in order to save costs. An act of lean is not necessarily a bad thing but in the ever changing markets that have perishable products such as dairy products an agile or leagile strategy would be more appropriate (Leuschner et al., 2013: 49).

3.6 Order processing

Order processing is generally associated with filling consumer orders. This includes transmitting order details to the sales section, verifying customers’ creditworthiness, facilitating the provision of the required service or inventories, preparing the shipment documentation, communicating the order status and payment methods and holding customer delivery details (Vogt et al., 2006: 12). However, what has been explained by Vogt et al. refers to basic transactional order processing.

Organisations nowadays have relationship based transactions too. More recently, vendors and buyers set up long term agreements describing how business will be conducted. The two organisations work together in a cooperative manner that strives to ensure that they both optimise their mutual benefits. However, this means that an optimal contract on quantity and number of deliveries, as well as delivery intervals, are

usually predetermined by both organisations (Huang, 2009: 1352). Even though such agreements help to decrease costs drastically, they may lack flexibility and responsiveness. This makes it difficult to accommodate the constant changes in customer demand that are associated with supply chains that are agile in nature (Huang, Tsai Wu, Chung, 2010: 445).

A more accommodating manner of cost reduction in order processing is to ensure a long-term relationship with the client(s) and also to use technologies such as the internet, EDI and electronic fund transfer (EFT) to speed up the processes (Urbaczewski, Jessup and Wheeler, 2002: 269).

Cost cutting should not detract from the efficiencies, flexibility and responsiveness of the process. Eliminating unnecessary administrative costs, for example, is key in establishing an agile supply chain since it reduces activities such as re-entering orders from the same customer month after month (Lee, Padmanabhan and Whang, 1997: 4). The elimination of such processes frees up a lot of time and also contributes to greater efficiency. Technologies such as interactive real time wireless programs (EFTs, emails and EDIs) assist in feeding the correct information, on time, throughout the supply chain. Employing these tools eliminates any holdups and assists in making sure that the information that is needed is readily available to make and deliver customer orders (Bennett, 2014: 325).

Order processing also has the responsibility to reduce lead time as much as possible; this is because no time should be wasted anywhere in the supply chain. According to Christopher, et al. (2004: 373) in order for any supply chain to compete successfully in volatile markets, it needs to be able to manage lead times such as time-to-market. This refers to the time it takes for organisations to recognise an opportunity and turn it into a product or service. Organisations also need to be able to manage time-to-serve, which refers to the time it takes to capture customers' orders and deliver to retailers. Finally, a competent supply chain should be able to manage time-to-react, which refers to the time it takes for an organisation to adjust its output in response to customers' volatile demand.

Not only is it the order processing department's responsibility to reduce lead time, it is also one of the areas that is usually considered for cost cutting or cost minimising

(Stadtler, Kilger and Meyr, 2014: 23). Extensive research into the topic of cost minimisation in the supply chain indicates that EDI systems, EFT and other technologies such as emails and the internet are the tools that can assist in reducing costs without compromising process efficiencies (Urbaczewski et al., 2002: 276).

The use of such tools also provides companies with opportunities such as efficiency, effectiveness, transparency and reliability in the area of order processing (Huang et al., 2010: 446). Part of the solution to a more agile supply chain appears to be making use of available technologies and collaborating with the relevant parties in the supply chain.

3.7 Demand forecasting

Demand forecasting is the process where an organisation determines the quantity of products and other related information that a customer may require in the short or long run. This information is usually used extensively in manufacturing, logistics and marketing (Vogt et al., 2006: 11). Demand forecasting is considered a very important activity that should be performed efficiently in any supply chain in order to be able to fulfil customer requirements on delivery (Reiner and Fichtinger, 2009: 55).

Efendigil, Önüt and Kahraman (2009: 6698) state that the supply chain process has four important stages i.e. supply, production, distribution and consumption and these stages include suppliers, warehouses, transporters, retailers and the final customer. These entities exist in the supply chain, not only to sell or move products along the supply chain, but also to share information, knowledge and resources that will satisfy customers' needs. In any supply chain, forecasting is said to be crucial since it directly affects the quantity of products or services (Efendigil et al, 2009: 6698). Forecasting product usage, market conditions, technological changes, the supply of goods and pricing is always necessary in order to make informed decisions in the supply chain. Even though forecasting requires a lot of time and resources to engage in, it is necessary and can save organisations from incurring many unnecessary costs (Helms, Etkin and Chapman, 2000: 396).

Demand forecasting in industry enables organisations to plan for and deploy quick response strategies that address their customers' needs. Quick Response (QR) is one of

the strategies that most organisations implement, especially in industries that are subject to volatile demand (Christopher et al., 2004: 372).

QR is defined as ‘A state of responsiveness and flexibility in which an organisation seeks to provide a highly diverse range of products and services to a customer in the exact quantity, variety and quality, at the right time, the right place and the right price as dictated by real-time customer/consumer demand’ (Christopher et al., 2004: 372). From this definition one can conclude that quick response and agility are interrelated. Utilising these strategies in an organisation or supply chain is dependent on the availability and accuracy of demand forecasting information. However, it is very difficult to predict markets that are constantly changing. For example, the fashion industry is considerably more difficult to predict than the dairy industry as the variations in the dairy industry can be more easily forecast than the ever changing market in the fashion industry (Ariza, 2014: 12).

Demand forecasting is particularly important in perishable goods markets such as the dairy products market. Any organisation, whether agile or not, that deals with receiving, transporting or selling any form of dairy products needs to ensure that it has access to reliable demand forecasts (So and Zheng, 2003: 169). Accurate forecasting and effective collaboration can assist organisations to anticipate how many items are likely to be demanded at a particular time and to then produce the quantities that will be needed. This will decrease costs associated with overtime work and with holding excess inventory.

Ideally, demand is forecast accurately, information and products flow up or down stream and there are no variations in the supply chain. However, in practice variations exist most of the time (Sheu, 2005: 798). Figure 3.2 illustrates how information and products flow throughout the supply chain. The diagram illustrates how retailers send their order information to their suppliers, the suppliers act on the information received from the retailer and then send products to the distributors and on to the retailers. However, retailers may decide to inflate their orders because they anticipate a bigger demand. Manufacturers too may inflate the forecast demand in order to accommodate possible increases in demand. If the demand does not increase, both the manufacturer and the retailer will suffer from overstocking. This phenomenon is known as the

bullwhip effect and is of major concern in industries such as the dairy industry where the products have a short life span.

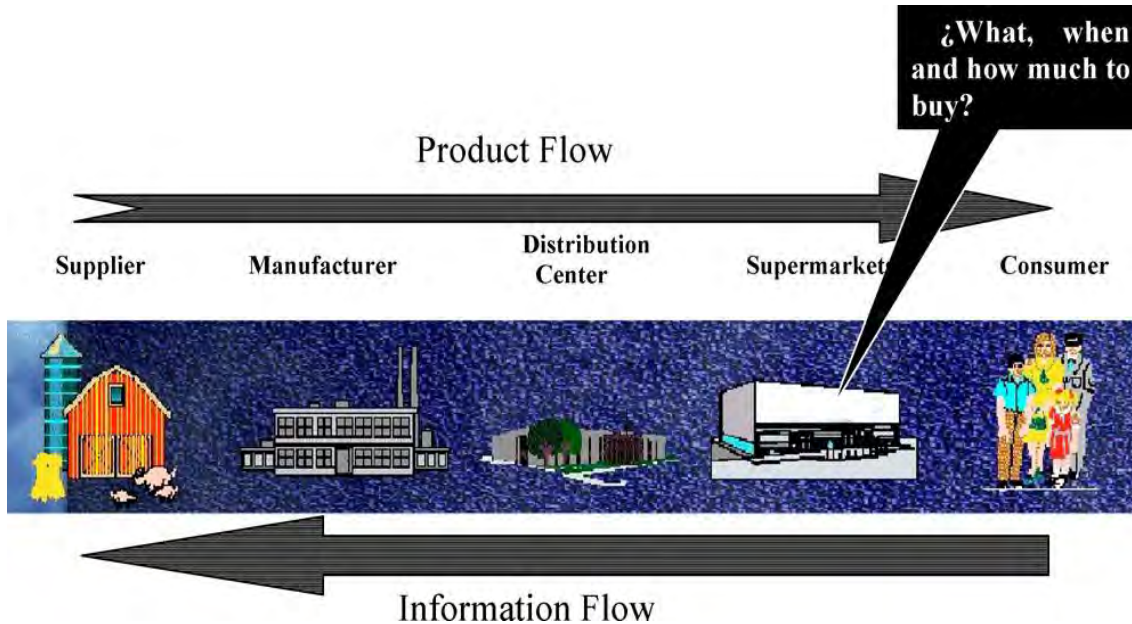


Figure 3.2 Information and product flow in a supply chain

Source: So and Zheng, 2003: 169

The bullwhip effect is exacerbated when there is miscommunication between the parties in the supply chain. This miscommunication results in increased variability in orders and inventory with the effect progressively more exaggerated further up the supply chain (Alizadeh, 2012: 177). This phenomenon is explained further below.

3.7.1 The bullwhip effect

“The bullwhip is a metaphor for the phenomenon that explains the increase as one moves up the supply chain” (Reiner and Fichtinger, 2009: 56). In the 1980s authors such as Blanchard (1983), Blinder (1982) and Kahn (1987) cited in Alizadeh (2012: 177) described the “bullwhip-like effect” that occurs in a supply chain. According to Sheu (2005: 798) the bullwhip effect has always been and remains a critical issue in supply chain management. Some order policies as well as incorrect demand forecasting are believed to be the major causes of the bullwhip effect (So and Zheng, 2003: 169). In

a supply chain a small variance in demand in the down-stream market is likely to cause an exaggerated variance upstream, in terms of procurement levels (Sheu, 2005: 798).

A study done by Lee et al. (1997) cited in So and Zheng (2003: 169) revealed that for strictly positively correlated demands, changes in retailer orders will always be larger than those of retailer sales with the level of change increasing in proportion to replenishment lead times. Reiner and Fichtinger (2009: 55) state that price variations also worsen the bullwhip effect. They state further that forecasting and pricing are related to one other. When prices change, this affects the forecast that was conducted before the change in prices took place. Therefore, pricing is a very important factor to take into consideration when forecasting demand.

Distortion of demand information is considered to be a major factor that contributes to the bullwhip effect. This is mainly caused by three related incidents; delayed information transfer throughout the supply chain, biased demand information from downstream chain members and incompatible logistics operations responding to downstream demand (Sheu, 2005: 798). The negative consequences of the bullwhip effect are clearly apparent in a supply chain that is agile or leagile. Supply chain operations may be crippled by not receiving the right information on time. This lends considerable support for why all the organisations in a supply chain need to make sure that they provide one another with the right information on time (Helms, et al., 2000: 396). Furthermore, this is why tools like EDI, the internet, EFTs and collaboration in demand forecasting have become very important in the supply chain.

As with any other problem, there are possible remedies to reduce the bullwhip effect in the supply chain. Remedies that may assist in reducing the bullwhip effect problem include recent advancements in technology (to increase visibility and communication in the supply chain), coupled with a number of time-based logistics control strategies. These include continuous replenishment planning (CRP) and Quick response (Sheu, 2005: 798). Alizadeh (2012: 178) emphasises that the major causes of the bullwhip effect are not only price fluctuation and incorrect demand forecasting but include unfavourable practices such as order batching, rationing and shortage gaming. The former refers to the practice where companies order in bulk weekly or biweekly instead of ordering when products are needed and in the amount needed at that time. Shortage gaming refers to the practice where a customer estimates that demand is going to go up

based on past experience. Retailers tend to order more than is actually needed and this then sends the wrong message to the supplier that demand has increased (Lee, Padmanabhan and Whang, 1997: 6).

Intuitively, there are four remedies to each of the problems mentioned above. The solutions would be to maintain price stability, to avoid order batching, to invest in more accurate demand forecasting and to eliminate shortage gaming. By resolving demand forecasting and bullwhip effect problems an organisation and its supply chain can achieve an agile supply chain that operates smoothly with real time and accurate information.

3.8 Inventory management

Essentially, inventory management is a logistics concept concerned with the overall management of the inventory that an organisation owns. Inventory is divided into three components; raw materials, work-in-progress and finished goods (Bowersox et al., 2002: 131). These authors describe inventory as a necessary evil and maintain that too much inventory compromises any organisation but that it is almost impossible for an organisation to operate without inventory.

Organisations place considerable emphasis on cutting down on unnecessary costs in their organisations and supply chains. Inventory is one of the major areas that should be considered in order to minimise costs (Bowersox et al., 2002: 131). Tersine and Waxker (2000: 114) emphasise that inventory management is crucial yet many organisations make the mistake of holding too much inventory that ends up gathering dust in their warehouses for extended periods of time. Too much inventory in any organisation or supply chain is considered as waste that is expensive and should be eliminated. This waste is considered “expensive” because it has costs associated with it. These costs include insurance costs, storage space rental and costs associated with obsolescence and damages (Stock and Lambert, 2001: 234).

Having excess inventory is contraindicated, in particular, with organisations that are agile since this may result in the organisation having inventory that may not be what the customers want. This inventory then becomes a liability and may even cause congestion in the work area (Browning and Sanders, 2012: 13). Inventory that sits in a warehouse

for long periods of time may become stale and obsolete, it may exceed shelf-life and also incur unnecessary costs (Stock and Lambert, 2001: 234). However, organisations continue to hold excess inventory in the supply chain due to demand uncertainty. The objective is to know how much and what type of inventory to stock.

Many warehouses and storages areas in organisations become inventory “graveyards” as a result of managerial errors and miscalculations but can be avoided through proper forecasting, communication and inventory management systems (Tersine and Waxker, 2000: 114). Several tools and concepts have been developed by organisations to try and manage inventories properly; strategies that use stock keeping units (SKUs), Vendor Management Systems (VMI) and just-in-time (JIT) are discussed below.

3.8.1 Stock Keeping Unit (SKU)

The dairy industry produces a number of products and there is considerable variety within the different product classes; different flavoured items, some with full cream, some low fat, others fat free, etc. This then implies that dairy firms are likely to have many different stock keeping units (SKU). There are generally four characteristics or groupings of SKUs that Kampen, Akkerman and Van Donk (2012: 867) describe. They are product volume, product name, customers and timing. The different SKUs overwhelm retail shelves on a daily basis so proper forecasting and inventory management is key in order to stock the desired products. Since these products are fairly seasonal and have a short life span, the key competitive factor is the ability to quickly respond to uncertainties or variances (Birtwistle et al., 2006: 337). Consideration of different SKUs is therefore very important in an agile supply chain that has a variety of products since it assists with classifying products according to customer orders and specifications. This allows for efficiency when picking different customer orders and consolidating them in the warehouse.

3.8.2 Vendor managed inventory (VMI)

According to Sari (2007: 530) VMI, also known as continues replenishment or supplier-managed inventory, was popularised in the 1980’s and is a widely discussed strategy for encouraging information sharing and collaboration in the supply chain. Vigtil (2007: 132) describes VMI as a form of supply chain collaboration where the supplier holds

the inventory and only delivers when orders have been placed. VMI is beneficial to all the entities in the supply chain but may be expected to provide more benefits to downstream members of a supply chain. As a result retailers are likely to benefit more than manufacturers and manufacturers more than their suppliers. This is mainly because most of the inventory remains upstream with the suppliers. Having suppliers carry the inventory is meant to assist the supply chain to be more efficient downstream and to be able to cater for customers more effectively and efficiently. This is achieved by making sure that the retailers only carry required inventory on their shelves, (Vigtil, 2007: 132).

According to Achabal et al. (2000: 433) VMI offers a competitive advantage to the retailers in a supply chain especially, as it provides these organisations with benefits such as lower ordering costs, high product availability, a reduced bullwhip effect and lower inventory monitoring costs. Gavirneni (2000), cited in Sari (2007: 530), observes that, paradoxically, most of the time retailers are the ones that are not very keen to share information in the supply chain. This may be due to the assumption, by retailers, that manufacturers are the primary beneficiaries of information sharing not retailers. However, in the dairy industry the manufacturers send all the products to the retailer and the retailers sell what they can and send back the unsold products to the manufacturers. This causes a huge loss to the manufacturers because the retailers can get away with inflating their orders because they don't incur the cost of unsold products that are expired and have to be disposed of (Achabal et al., 2000: 433).

In a study done by Waller et al. (1999:185) cited in Poojary and Kumar (2014: 46), the author discovered that VMI enhances inventory reduction and a higher utilisation of manufacturing capability which results from the regular inventory reviews and shorter breaks between deliveries. The most important benefits of VMI are transparency and demand visibility, which are also some of the fundamental principles of an agile supply chain. Transparency throughout the supply chain makes life easier for all parties concerned i.e. buyers, sellers and 3PLs (Vigtil, 2007: 133).

Technology is obviously the main driver of such initiatives; without the proper technological advancements any VMI initiative will not be much of a success. Simchi-Levi et al. (2003: 161) states that the transmission of data electronically in the supply chain cuts down on data transfer time and entry mistakes. The use of EDI, bar codes and scanners become important in maintaining effective and efficient VMI.

Whilst there is no doubt that VMI offer organisations many benefits, there are however also a number of challenges that hinder the success rates of VMI initiatives. Simchi-Levi et al. (2003: 161) describe a grocery chain named Spartan stores that had to shut down its VMI efforts a year after implementation because of a failure to deal with product promotions. Kmart also had to suspend a number of VMI contracts because of a lack of satisfaction with their VMI partners who demonstrated an inability to forecast (Sari, 2007: 530).

An organisation or supply chain that is agile needs to invest in initiatives, such as VMI, that are customer focused, efficient and effective. Agility is not something that can be achieved by an organisation in isolation; in order to be able to execute successful VMI, collaboration and prompt sharing of accurate information is important (Ohno, 2011: 125).

3.8.3 Just-in-time (JIT)

Just in time or JIT is a concept that was originally developed by Toyota in the 1970s. JIT is also known as the Zero Inventory Production System (ZIPS), Kanban production and Kaizen Quick Response (QR) (Biggart and Gargeya, 2002: 197). JIT is a pull system that seeks to pull the desired units or services through the system as and when they are needed rather than to push them into the system before they are needed. This method is shown to dramatically reduce excess inventories.

According to Biggart and Gargeya (2002:197) the JIT principle is based on three fundamental principles; elimination of waste, continuous quality improvement and improvement and encouragement of worker participation. In a study by Lieb and Miller (2000: 6) that looked at JIT and transportation activities, it was evident that JIT had led to changes in the modes of transport that were used for both inbound and outbound logistics. Many organisations had moved away from rail transport to road transport because of the need to cater for agility which requires smaller and more frequent just-in-time deliveries (Lieb and Miller, 2000: 6). The study also revealed that mostly contracted trucks /3PLs were being used by companies and this appeared to benefit the organisations considerably.

A noteworthy aspect of JIT is that even though originally it was created for a manufacturing environment, it is not limited to the manufacturing environment and many service organisations, including 3PLs, are also using the JIT system (Biggart and Gargeya, 2002: 197). Lieb and Miller (2000: 6) stress that even though JIT provides a number of benefits for organisations, there are also unavoidable extra costs to supply chains or organisations that seek to implement JIT. These costs are associated with the increased inbound and outbound logistics activities and investment in information technologies. However, these costs do not exceed the benefits that customers gain. These include on-time deliveries, reduced quantities of raw materials, fewer stock outs, fewer damaged goods, reduced in-bound shipment sizes and access to readily available information (Lieb and Miller, 2000: 8).

3.9 Packaging

Packaging is the activity that serves to contain, protect and make the handling of a product easier (Vogt, 2006: 133). Packaging is important in three main respects; logistically, commercially and environmentally. Vogt et al. (2006: 134) elaborate that packaging enables unitisation, convenience and apportionment of products and is also used as a source of information and for marketing purposes.

According to Garcia-Arca, Prado-Prado and Garrido (2014: 326), changes in the market, such as a requirement for agility, small volume requirements and the increase of self-service concepts, will require organisations to put more emphasis on efficient packaging. Furthermore, as Jahre and Hattelanda (2004: 123) point out, there is a constant increase in the distance between the point of production and the point of consumption of products and this too has resulted in efficient packaging becoming even more of a necessity.

The role of packaging in distribution is becoming increasingly important and is subject to many influences (Jahre and Hattelanda, 2004:123). According to Garcia-Arca et al. (2014: 328) there are now more developments arising from new technologies such as RFID's that make packaging more efficient and user friendly. According to Hellström and Nilsson (2011: 638) there are four areas or trends that currently affect efficient packaging in the market; these are the business dynamics of the packaging industry, legislative frames, consumption trends and distribution trends. Firms who can succeed

in anticipating these trends before they affect the market are usually able to gain a competitive advantage within the industry that they operate.

In a 1997 study that was conducted by ECR Europe it was discovered that standardisation of pallets and containment for the fast moving consumer goods industry saved some organisations money. This was achieved through better space utilisation, more efficient handling of the products and reduction in the packaging materials used (Daniel et al., 2011: 638). Another strength that was derived from standardisation of packaging was that it promoted efficiency since it makes it easier to develop efficient standardised logistics systems. This makes operations easier since standardisation facilitates uniformity of packaging, materials handling equipment and transportation.

3.10 Reverse logistics

Reverse logistics can be defined as the process of forward logistics done in reverse with traditionally the core purpose of reverse logistics being the process of recycling products (Guojun, 2006: 55). However, contemporary definitions vary depending on which tier of the supply chain is providing the explanation. Retailers define the process as giving back to the manufacturer all the products that have been returned by customers. Manufacturers define reverse logistics as the processes involved in returning to the supplier the reusable containers or defective products that have been returned by final customers or retailers (de Brito, Dekker and Flapper, 2005: 248).

The Council of Logistics Management (CLM) defines reverse logistics as the method of planning and implementing efficient and effective control of inventories and other related information from the final customer to where the product was manufactured. The purpose of reverse logistics is the proper disposal or recapture of value of a product (de Brito, Dekker and Flapper, 2005: 248).

Reverse logistics is generally carried out by other organisations that are not specifically linked to the supply chain. Guojun (2006: 58) cites an example of how paper and metal are usually collected by recycling companies or individuals that are “not part” of the supply chain but are just interested in the profits that may be made. Reverse logistics includes activities such as returning products to the manufacturer due to damage or spoilage, product recall, restocking, salvage, excess inventory, hazardous material

programs, remanufacturing and refurbishing products, obsolete equipment disposition, reconditioning or to recycle packaging materials for reuse (Guojun, 2006: 58).

Bai and Sarkis, (2013: 307) state that flexibility in the supply chain, including reverse logistics, is necessary to handle uncertainty and the possibility of channel disruptions. These authors then suggest that efficient and agile reverse logistics are necessary to respond to complex and uncertain environments. In a study by Hung and Wang, (2009: 456) the four companies that were studied indicated that they believe that since reverse logistics includes recall of defective goods, this can be used to enhance customer service by promptly responding to reports of defective products. Being agile in the provision of replacement products would increase the level of customer service for the organisation or supply chain. However there are a number of factors that may constrain the smooth running of logistics and are likely to restrict the agility of reverse logistics. de Brito, Dekker and Flapper (2005: 248) identified the following factors as likely to adversely affect the smooth running of reverse logistics:

- A lack of information and technological systems
- Financial constraints acting as important barriers to good reverse logistics operations.
- Some company strategies that restrictive the implementation of reverse logistics operations
- A lack of knowledge about the benefits of reverse logistics
- Resistance from participants in the supply chain to transform
- The quality of the end-of-use/end-of-life returned products
- Lack of training and education a major challenge to commercial recycling
- Lack of support from dealers, distributors, retailers and 3PLs.

3.11 Conclusion

As a result of constantly changing markets and changes in consumer behaviour, many companies have been forced to re-evaluate their operations and those of their third party logistics providers. Companies such as those in the dairy industry are faced with customers who desire fresh products, at the right time, right place and of optimum quality. While lean strategies may assist in this regard, on their own, they are not sufficient. All logistics activities, as reviewed in this chapter, whether performed by an

in-house logistics department or a third party logistics provider, need to be aligned with the needs of the dairy industry and its customers. Agile logistics strategies based on information sharing, collaboration and visibility will contribute to good working relationships and result in a highly competitive, agile dairy industry supply chain.

CHAPTER 4: RESEARCH METHODOLOGY

4.1. Introduction

The previous chapters provide an account of the dairy industry and its problems, issues and possible areas for improvement regarding the logistics of the industry. Relevant literature was reviewed and this provides an insight into the current situation of logistics activities in the dairy industry. Lean, agility and leagile logistics were described. The requirements of a firm that has or desires to have agile logistics services, whether in-house or through the use of 3PLs, was outlined. The research objectives defined in the first chapter have guided the researcher in developing the questions that have assisted with obtaining more information regarding the provision of logistics services that address the needs of the dairy industry.

This research methodology chapter outlines how data was collected, the data collection methods that were used, how the data was analysed and the ethical considerations that were addressed in the study. The research took the form of a case study that investigated one particular dairy firm and two of the retail outlets that it supplies. The research questions posed at the outset of the study shaped the research design. These questions then defined the research objectives.

4.1.1. Research questions

- To what extent do South African 3PLs provide agile, leagile or lean services to the dairy industry?
- To what extent does the dairy industry in South Africa require agile logistics services from 3PLs?
- How challenging is it, or will it be, for South African 3PLs to provide agile or leagile services to dairy companies?
- What are the specific challenges that 3PLs face, or will face, when attempting to implement agile strategies for the dairy industry?
- What will be the future needs of stakeholders in the dairy industry; the dairy companies, 3PLs and retail customers?

4.1.2 Research Objectives

- To assess the type of service currently offered by South African 3PLs serving the dairy industry.
- To determine the extent to which the dairy industry in South Africa requires agile services from 3PLs.
- To assess the level of difficulty that 3PLs are likely to face when they provide agile or leagile services for dairy companies.
- To identify the specific challenges that 3PLs face when attempting to implement agile strategies.
- To identify the future needs of stakeholders in the dairy industry i.e. the dairy companies, 3PLs and retail customers.

4.2. Research design

According to White (2009: 98) the research design begins when research questions are formulated and developed as a research project. He mentions that this is the stage where the researcher actually starts thinking about how the research questions will be answered. The research design addresses aspects such as the purpose and nature of the study, the data collection methods and the analysis of the data. The research design assists the researcher to define and answer the research questions unambiguously, to test theories or describe a phenomenon in the best possible way (Creswell, 2003: 3). This research conducted in this study was exploratory and based on a case study. The data was collected through semi-structured interviews and was analysed using a thematic analysis. The various aspects of the research design are explained below.

4.3 Research Approaches

The study adopted a qualitative approach to gathering data. A qualitative study is ideal for an exploratory, investigative type of study rather than a quantitative approach that is better suited to an explanatory or hypothetico-deductive study (Sekaran and Bougie, 2013: 26; 97). Qualitative data is said to be the best strategy when dealing with human respondents and when the researcher is exploring a particular behaviour, trend, state or development (Merriam, 2002: 4). Using a qualitative research method tends to get the respondents more involved in the study as they devote their time to providing the

researchers with data. This exercise is said to also make them feel that they are a greater part of the study (May, 2003: 265).

According to (Myers, 2009) quantitative research tends to focus on numbers more than anything else, and such information would not assist in producing the required information for this study. Quantitative research is not ideal for this type of a study as it fails to obtain deeper insights and is not effective at gathering the required data from human respondents (Welman et al., 2005: 6). The qualitative approach has assisted the researcher to assess the current state of logistics in the dairy industry, to assess what has changed and what still needs to change to move forward in terms of pursuing either lean, agile or leagile. Table 4.1 summarises the key characteristics of qualitative and quantitative research respectively.

Table 4.1. Attributes of quantitative and qualitative methodologies

Quantitative approaches	Qualitative approaches
Nomothetic	Idiographic
<ul style="list-style-type: none"> • Extensive 	<ul style="list-style-type: none"> • Intensive
<ul style="list-style-type: none"> • Generalizing 	<ul style="list-style-type: none"> • Individualizing
Explanation	Comprehension
<ul style="list-style-type: none"> • Prediction 	<ul style="list-style-type: none"> • Interpretation
<ul style="list-style-type: none"> • Generalization 	<ul style="list-style-type: none"> • Contextualization
Deduction	Induction
<ul style="list-style-type: none"> • Theory-driven 	<ul style="list-style-type: none"> • Data-driven
<ul style="list-style-type: none"> • Hypotheses-testing 	<ul style="list-style-type: none"> • Hypotheses-generating
<ul style="list-style-type: none"> • Verification-oriented (confirmatory) 	<ul style="list-style-type: none"> • Discovery-oriented (exploratory)

Experimental	Naturalistic
<ul style="list-style-type: none"> • True-experiments 	<ul style="list-style-type: none"> • Case-study (narrative)
<ul style="list-style-type: none"> • Quasi-experiments 	<ul style="list-style-type: none"> • Discourse analysis
	<ul style="list-style-type: none"> • Conversation analysis
Non-experimental	Focus group
<ul style="list-style-type: none"> • Correlational 	<ul style="list-style-type: none"> • Focus group
<ul style="list-style-type: none"> • Correlational–comparative 	<ul style="list-style-type: none"> • Grounded theory
<ul style="list-style-type: none"> • Correlational–causal–comparative 	<ul style="list-style-type: none"> • Ethnographic
<ul style="list-style-type: none"> • Ex-post-facto 	
Internal validity	Internal validity
<ul style="list-style-type: none"> • Statistical conclusion validity 	<ul style="list-style-type: none"> • Descriptive validity
<ul style="list-style-type: none"> • Construct validity 	<ul style="list-style-type: none"> • Interpretative validity
<ul style="list-style-type: none"> • Causal validity 	<ul style="list-style-type: none"> • Explanatory validity
Generalizability	Generalisability
<ul style="list-style-type: none"> • External validity 	<ul style="list-style-type: none"> • Transferability

Source: Gelo, Braakmann, Benetka, 2008: 271

There are a number of different forms that research can take; research can be descriptive, causal, explanatory or exploratory depending on the results that are required of the study and the type of research approach that the study is taking in terms of being qualitative or quantitative. These approaches will be briefly discussed below.

4.3.1 Causal research study

A causal research study is a study that seeks to find out the cause and effect relationship (Sekaran and Bougie, 2013: 98). Causal research looks at the extent to which the cause and the effect vary or occur together in a way that has been predicted by the hypothesis being tested. This type of research is usually quantitative in nature, and is favoured

when the occurrence of certain events needs to be studied. In this type of research the theory is that A “produces” B or A “forces” B. Empirically the researcher can only imply that A produces B based on what they have discovered and there may be many possible causes that could have resulted in the observed phenomenon. (Cooper and Schindler, 2001: 148).

4.3.2 Descriptive research study

A descriptive research study is usually conducted when a researcher seeks to describe characteristics of a situation or a variable of interest. The goal of this type of study is to present the researcher with information that will describe the relevant aspects of the event, organisation or the situation under the study (Sekaran and Bougie, 2013:15). Descriptive research studies are also described as studies that are concerned with analysing and describing characteristics of a phenomenon, individuals or groups (Kothari, 2004: 31). This type of study is mainly qualitative. A descriptive research study looks for comparisons and a narration of facts; it does not dig further into finding out more about the situation. In this type of research the researcher also needs to know clearly what she wants to measure and have adequate methods of measuring it (Kothari, 2004: 37).

4.3.3 Explanatory research study

Explanatory research studies are studies that are conducted in order to develop a causal explanation of a social phenomenon (McNabb, 2014: 28). One of the fundamental purposes of an explanatory study is to build a theory that can be used to explain a particular situation; this type of study is mostly used in studying social occurrences. The theory that is developed from a particular study can be used to predict similar future occurrences (McNabb, 2014: 28). Explanatory studies are very similar to the causal studies described in 4.4.1 above.

4.3.4 Exploratory research study

Exploratory research usually takes place in a situation where the researcher has an idea about a phenomenon but seeks to conduct research in order to gain an even better understanding. Exploratory research tends to also lay a foundation for future research

around the topic (Kowalczyk, 2014: 1). Usually, exploratory research is conducted more effectively when the researcher exposes her/himself to the situation so that s/he may discover as much as possible about the situation (Stebbins, 2001: 1). The major emphasis of this type of research is in discovering new ideas and gaining some new insights. In an exploratory study the researcher must be flexible in the collection of data so that s/he is able to collect as much data as possible in order to understand the situation more deeply (Kothari, 2004: 34).

After assessing the objectives of this study and the type of information that the researcher sought to obtain, a decision was made to adopt an exploratory research approach. This type of research was intended to give the researcher an insight into the current operations in the dairy industry's logistic areas and to determine what the future expectations for the industry may be.

4.3.5 Case study

A case study approach is an approach to conducting research that allows the researcher to be able to explore a phenomenon, program or episode in an in-depth manner. Cases are usually for a specific time frame and during that time the researcher collects as much data as possible, using different data collection techniques (Creswell, 2003: 15). This approach allows the researcher to evaluate and explore the situation through a variety of lenses that allow for the different aspects of the phenomenon to be discovered and understood (Baxter and Jack, 2008: 544). According to Baxter and Jack (2008: 544) there are five different types of case studies that a researcher can undertake. These are exploratory, descriptive, multiple case studies, explanatory and intrinsic case studies. An exploratory case study approach is the one that has been used in this study.

This case study focuses on a dairy company operating in the KwaZulu-Natal (KZN) region. As mentioned above, the nature of this case study is exploratory as it seeks to explore the need for agile or leagile in the dairy industry. It also seeks to find out what sort of difficulties or challenges an organisation faces in its attempt to become agile in performing its logistics services, whether in house or through the use of 3PLs. Finally, this case study will assist in assessing if there is a need for agile or leagile third-party logistics services in this industry.

A case study approach can be used to establish valid and reliable information. This information can either be used as a positivist or phenomenological perspective, and be synthesised in a manner that produces a theoretical assumption, or it may be used to support or contradict an established theory (Remenyi et al., 2005: 164). In this study the case study is used in a phenomenological perspective to establish if the dairy company needs an agile 3PL or logistics department in order to be better able to cater to their customers' needs.

4.4 Sampling method

There are a vast number of strategies and techniques that maybe used to select a representative sample for a study. A study may be conducted using either a probability sampling method or a non-probability sampling method (Remenyi, Williams, Money and Swartz, 2005:193). In a probability sampling method individuals all have an equal chance of being selected to be part of the study (Welman, Kruger and Mithcell, 2006: 151). A non-probability sampling method, on the other hand, uses the personal judgment of the researcher to select participants to be part of the study (Remenyi et al., 2005: 193).

This study has used a purposive, non-probability sampling method. This sampling method uses personal judgement to select the participants. In this sampling method, not every item or party in the population has a fair chance of being selected. In this study the researcher selected individuals and organisations who were likely to provide the researcher with the desired information. According to Sekeram and Bougie (2013: 252), using a judgement approach, the researcher chooses the population that is most advantageously placed or is sufficiently well informed to provide the information that is needed.

4.5 Target population and study site

The targeted population for this study resides in the KZN province, South Africa. Preliminary research in the on-line business press and first-hand investigation of dairy products and brands in various retail shops indicated a comparatively homogenous industry with a number of dairy companies all competing for market share in very similar product categories. The majority of dairy companies in South Africa operate

either nationally or in two or more adjoining provinces. The researcher decided to select one of the many dairy companies operating in KZN on the assumption that it would be reasonably representative of the dairy companies operating in the country, in the context of the objectives of this study. The decision to choose KZN was based on the fact that the coastal areas in South Africa (KZN, Western Cape and Eastern Cape) are the biggest milk producers (nda.agric.za:2012, 4). The study investigated the operations and logistics of this one organisation as well as certain other parties that play an important role in the downstream movement of the products in the dairy company's supply chain. Diagram 4.1 indicates the main focal area that is covered by the dairy company that was selected.



Figure 4.1: Focus area for Company A

Source: Wikimedia, 2011: 1

In this study the researcher interacted with different people from different departments within and outside the selected dairy organisation. The researcher communicated with the following parties:

1. The logistics manager of the dairy company (“Company A”)
2. The operations manager of the dairy company (“Company A”)
3. Two retail shop managers (one manager from a large retail store or supermarket, the other from a smaller convenience store)
4. Two merchandisers in the retail shops (as above)

People working in different departments, organisations and in different functional roles were selected for this study because the researcher sought to gain the widest possible perspective of the current situation, the issues of contemporary importance, current problem areas, levels of satisfaction and areas for improvement. The researcher determined that this sample size would be adequate for the purposes of this study and to collect the required data. The selected dairy company and retailers also have branches in other areas outside KZN which tends to suggest that, to a certain extent, the findings of this study may be also be relevant to other dairy companies and retail stores beyond the confines of this study. As has been stated, the dairy industry in South Africa is relatively homogenous; companies compete with similar or identical products in mostly the same markets.

4.6 Data collection methods

There are a vast number of tools that may be used to collect data; these tools include focus groups, interviews, questionnaires, observations, the internet, company records, archives, government publications, industry analysis, websites, as well as others (Sekaran and Bougie, 2013: 116). These data collection methods can be used to collect either primary or secondary data.

Primary data refers to data that has been collected by the researcher first-hand, in order to gather information specifically for the research at hand (Remenyi et al., 2005: 141). Secondary data refers to data that has been collected from pre-existing sources; this information may have been collected for another reason but is appropriate for use in a different study (Remenyi et al., 2005: 141).

This study has used only primary data. In-depth semi-structured interviews were used to collect the data in this research.

4.6.1 Interviews

There are two main forms of interviews that can be conducted by a researcher; namely structured and unstructured interviews (Sekaran and Bougie, 2013: 118). A structured interview is one that has been prepared in advance of the interview session. In a structured interview session, the respondent is asked a question and the researcher notes the answer and moves on the next question, with no further follow-up or clarity seeking

questions asked. The next participant is also asked the same questions in the same manner (Myers, 2009: 121).

The structured interview approach rather limits the researcher and leaves a very small room for flexibility during interviews. Conversely, an unstructured or semi-structured interview allows for flexibility as the researcher is free to direct the interview toward the problem area or an area of interest that has become apparent during the interview session. (Myers, 2009: 121). Semi-structured interviews also allow the researcher to be able to probe certain questions to gain more clarity (Remenyi et al., 2005: 111).

4.6.1.1 In-depth semi-structured interviews

This study made use of in-depth semi-structured interviews. The interview guides were developed in a manner that allows the researcher flexibility; to allow the researcher to be able to probe areas of interest that arise during the interview. (Sekaran and Bougie, 2010: 189). In-depth interviews allow the participants to feel at ease and this creates rapport which encourages greater trust and the desired commitment from the respondents (May, 2003: 120). In-depth interviews are mostly used in qualitative research studies as the setting creates a comfortable environment for the interviewer and the participant which then allows the researcher to dig deeper to obtain the information that is needed (Clifford and French, 2010: 105).

4.6.1.2 Interview guides

The interview guide is a document that a researcher prepares in advance of data collection; on the interview guide are a number of questions or key aspects that the researcher will be probing in the interview sessions (Cohen and Crabtree, 2006: 1). The researcher has to ensure that the questions that have been prepared elicit answers that will fully answer the research questions of the study. In this study the questions in the interview guide were prepared with the data that is required in mind. The researcher used in-depth semi-structured interviews in order to be able to really engage with the subject and to probe certain areas in greater depth.

Four separate semi-structured interview guides were developed. Each guide was customised and designed to probe the areas that the researcher anticipated the respondent/s would be sufficiently well informed of and so able to provide valid and meaningful information. The interviews comprised open-ended questions that sought to

encourage the respondents to think deeply about the issues under consideration in keeping with the exploratory nature of the study. The questions were categorised into five areas. Some questions were common to one or more respondent groups whilst some questions and categories were deemed not relevant to certain respondent groups. Table 4.2 lists the respondent groups and the question categories that were developed and the number of questions posed.

Table 4.2 Respondent groups and question categories

QUESTION CATEGORIES	RESPONDENT GROUPS			
	Logistics Manager	Operations Manager	Retail Manager	Merchandiser
General dairy industry	3	5	0	*3
Responsiveness	4	7	6	4
Cost	5	0	2	0
Value-added services	3	6	4	**2
Flexibility	3	10	0	***6
Total number of questions	18	28	12	15

*Questions concerning communication

**Questions concerning customer service

***Questions concerning efficiency

The semi-structured interview guides for the four different respondent groups are attached as appendices A – D at the end of this dissertation.

4.7 Data analysis

Data analysis can be conducted in many different ways, using a number of different tools. Data can either be analysed in a qualitative or quantitative manner, depending on the collection method used and the type of data collected (Sandelowski, 2000: 252).

Data analysis in qualitative research seeks to explain, highlight and convince the reader of the situation as it is. This process of data analysis requires that the researcher thoroughly understands, reflects on and interprets the data (Carcary, 2011: 10). Hurbeman and Miles (2002: 309) state that qualitative data analysis is essentially defining, detecting, categorising, mapping and explaining the data that has been collected.

However, the problem with analysing qualitative research studies, unlike with quantitative research studies, is that there are no set and well-established common rules and guidelines for analysing data (Sekeran and Bougie, 2013: 337). A few general data analysis techniques in qualitative research have emerged; the researcher considered thematic and content analysis. These are closely related forms of analysis which are explained below.

4.7.1 Content analysis

Content analysis is a method of analysing verbal, written and visual messages (Stemler, 2001: 1). When it first emerged, this type of analysis was used as a method of analysing hymns, magazines and newspapers (Stemler, 2001: 1). However, during the past few decades, it has grown steadily in the field of journalism, communication, psychology and business (Elo and Kynga, 2007: 108). According to Cavana, Delahaye and Sekeran (2001: 171) content analysis involves coding and categorising patterns in the data that have been collected. This type of analysis allows the researcher to be able to easily sift through large volumes of data. This technique can also be very helpful when a researcher is studying a particular aspect or behaviour of individuals, groups and institutions (Stemler, 2001: 1). According to Elo and Kynga (2007: 108) content analysis is also known as a method that is suitable for making replicable and valid interpretations from the data with an intention to provide new understanding, insight and a presentation of facts.

According to Weber (1990: 9) content analysis is used by many researchers because it has advantages, such as a focus on the information that has been communicated. The analysis is able to provide both qualitative and quantitative forms of information. This type of research also enables the researcher to ask questions in such a way that a

respondent may not be aware of the type of information that is sought. This assists in eliminating bias on the part of the respondent.

4.7.2 Thematic analysis

Thematic analysis is an accepted method of analysing data when investigating texts, more especially mass communication research (Marks and Yardely, 2004: 57). Thematic analysis is very similar to content analysis but goes a bit further in investigating the qualitative aspect of the data that is being analysed. With both thematic and content analysis the idea is to identify themes in the research and find out how much of the information gathered relates to each of the themes. These themes are coded and then conclusions may be drawn from the themes and relationships discovered in the study. Thematic analysis is different from content analysis in that it is able to detect the context in which the word has been used; it is considered to focus more on the qualitative aspects of the data than anything else (Marks and Yardely, 2004: 57).

The thematic method identifies and analyses meaning in the data that have been collected. Thematic analysis analyses the answer given by the respondent and then relates it to the research questions of the study. The themes that are identified in this type of study are points that capture something that is important about the data and needs to be further analysed (Braun and Clarke, 2008: 79). When the themes in this analysis are identified and analysed the end results are meant to highlight the most prominent patterns in the data and show how these answer or relate to the research questions (Joffe, 2012: 2).

4.7.3 Conducting the analysis

The themes that were identified in this study after collecting the data, are mutually exclusive and exhaustive in nature (Cavana et al, 2001: 171). These themes were highlighted when the researcher was reading through the data. Each highlighted theme was given a theme code which was then recorded in the data index so that a record of the list of themes was kept. The highlighted portions were then grouped into separate records so that each theme has a collection of quotes from each respondent (Cavana et al, 2001: 171). The following are the steps that were taken in analysing the data that was collected (after Cavana et al., 2001: 173);

- Step 1: The data was collected, recorded and later transcribed by the researcher
- Step 2: The data was source coded in order to avoid any confusion at a later stage, and respondents were each given unique identifiers
- Step 3: The researcher then read through the transcribed data and listened again to the recordings to make sure that nothing was missed out
- Step 4: During the listening and reading the researcher then identified themes and categories that could be used to group the data
- Step 5: When the researcher had found what she thought was the next theme she compared it to the ones before in order to make sure that the themes were exhaustive and mutually exclusive
- Step 6: Each passage from the data collected, along with the source code, was then taken and put under a theme that the researcher associated it with. Any passage or text that could not be categorised with an initial coding scheme was given a new code.
- Step 7: The researcher then studied the causes and consequences, interactions, strategies, conditions and concepts that cluster together.
- Step 8: The researcher read through the theme files to look for sub-themes as well as relationships between the subthemes and relationships between other themes
- Step 9: In this stage the researcher identified rules for inclusion, which assisted in identifying the characteristics of the different passages of the raw data that served as basis for including or not including subsequent data
- Step 10: After the researcher had categorised the data and made sense of homogeneity and purity, she then mapped the data in order to find out the relationship between the different phenomena
- Step 11: Having mapped the data and made better sense of relationships between the data that was categorised, the researcher was then able to write a report and to draw conclusions based on the themes discovered as well as the relationships that were established in the data collected.

4.8 Reliability and validity

Reliability of the study indicates the extent to which the data collected and analysed is without error and hence provides consistency throughout the document (Cavana et al.,

2001: 213). Reliability looks mainly at the credibility of the findings. In a qualitative study this will be looking at the people that were interviewed and how likely they are to give the required information with low to zero levels of bias (Welman et al., 2005: 145). While thematic analysis is a widely used and beneficial way of analysing data for qualitative studies it is prone to bias by the researcher. This may affect the manner that the data is collected, analysed and interpreted (Kolbe and Burnett, 1991: 246).

Validity in a quantitative sense looks mainly at whether the instrument used to measure the results is accurate or not (Cavan et al., 2001: 212). Validity in a qualitative research study however is different from validity in a quantitative research study. The focus on validity in qualitative research is on the extent to which the results accurately represent the collected data (internal validity), and the extent to which the data can be transferred to other similar settings (external validity) (Sekaran and Bougie, 2009: 384). Cavana et al. (2001: 212) also write about internal and external validity and stress the importance of authenticity of the research as well as the level of generalizability to the external environment.

In this study, in order to obtain the validity and reliability of the data collected, semi-structured interviews were used to collect the data. Also, people from different but relevant departments within the organisations were interviewed in order to obtain different perspectives of the situation under study. The researcher recorded the interviews and subsequently transcribed all the relevant data in order to make sure that all the important information was captured accurately.

4.9 Ethical Consideration

The researcher provided the participants with an informed consent form to read, complete and sign in order to ensure that they were participating of their own free will. The researcher also informed the respondents that they were free to withdraw from the study at any stage should they wish to. The confidentiality of personal data of respondents will continue to be maintained. The ethics committee at the University of KwaZulu-Natal provided the researcher with ethical clearance before any form of primary research was undertaken. This was intended to assist in guiding the researcher to conduct herself in an appropriate and ethical manner. Any secondary information that has been used in this study has been referenced accordingly.

4.10 Limitations of the study

Any study that is conducted will always be prone to certain limitations. The limitations of each study differ; they range from failure to obtain the required sample size, to not being able to get the right kind of respondents and not being able to obtain as much information as desired. The limitation of this study is that since it is qualitative the findings and conclusions cannot be generalised to other dairy companies or dairy industries in other regions. A qualitative study is not always reliable because each environment and the behaviour of people are usually different. Also, the researcher wished to include other organisations within the dairy industry in order to make the sample size more representative but time and cost constraints prevented this. As a result, it should be borne in mind that one organisation may not be assumed to represent the entire population of organisations in the KZN dairy industry.

4.11 Conclusion

This chapter has highlighted and explained how the data collection for this study was planned and executed. The manner in which data was collected, analysed and presented, and the reason for choosing the techniques that were used was also explained. Various designs, techniques, tools and methods of analysis used in a qualitative research study were described. The reason for selecting an exploratory research design was explained. The use of semi-structured, in-depth interviews in the study gave the researcher the flexibility needed to probe certain areas further and also to create a rapport with the respondents so that they would feel comfortable and really engage with the study. Thematic analysis was chosen for this study as it assisted the researcher to create themes, to analyse the themes and to then map them to find out the relationships that exist in the study.

CHAPTER 5: FINDINGS, ANALYSIS AND DISCUSSION

5.1 INTRODUCTION

The first chapter of this dissertation provided a background to the study and introduced the research questions. The second chapter reviewed literature relevant to the logistics of the dairy industry and the role of lean, agile and leagile in logistics operations. The previous chapter outlined the research design and methodology that has been used in this study, the data collection techniques and the manner in which the data was analysed. The previous chapters of this study have elaborated on the research questions that were outlined at the outset. This chapter presents the findings and analyses of the data that was gathered from the empirical study.

Objectives 1 and 3, listed below, have been partly addressed in previous chapters. This chapter integrates the information presented in previous chapters with the findings obtained from the empirical study. This approach accords with the exploratory nature of the study and provides a more comprehensive means of addressing the objectives. The objectives, as set out in chapter 1, are:

1. To assess the type of service currently offered by South African 3PLs serving the dairy industry.
2. To determine the extent to which the dairy industry in South Africa requires agile services from 3PLs.
3. To assess the level of difficulty that 3PLs are likely to face when they provide agile or leagile services for dairy companies.
4. To identify the specific challenges that 3PLs face when attempting to implement agile strategies.
5. To identify future developments desired by the stakeholders in the dairy industry i.e. the dairy companies, the 3PLs and retail customers.

This chapter focuses on the overall analysis of the data that has been collected in this study. The chapter seeks to provide an in-depth analysis of the data, the level of participation and the relevance of the contributions that were made by the parties involved.

5.2 Overview of the Dairy Industry

Internationally the dairy industry is an important industry to the majority of the population and is one of the fastest growing industries in the world. In the United States, over the past few years, the industry has been growing dramatically because of emerging international markets (Innovation Center for U.S Dairy, 2009: 6). There is perhaps similar scope for the South African market as the standard of living for a number of people seems to be increasing with disposable incomes, on average, increasing too.

The review of literature, as desktop research, indicates that the dairy industry is an industry that thrives on efficiency and responsiveness towards customer needs. This is evident too from the several responses that were gathered from the respondents. The Logistics manager and Operations manager of the dairy company stated that, *“Delivery intervals and quantities are set up as per demand that has been forecast but there is room for flexibility since products are delivered every day or every second day.”*

They also mentioned that, *“We cannot make our customers wait or run out of stock at the retail shop. When unforeseen events happen we try by all means to attend to that situation as soon as possible. We just have to have products available at the shop all the time.”*

The retail managers at the two stores that were visited in the Pietermaritzburg area shared the same sentiments as the logistics and operations managers from the dairy company. The retail manager in the bigger shop said that, *“Our priority is frequent deliveries from suppliers; they must have better cold chain and stock rotation, and we need fresh and quality products, so frequent deliveries are very important.”*

The retail manager of the smaller shop stated that, *“Frequent deliveries are very necessary since they make control of stock to be much better. In fact I wish they could deliver everyday but the current arrangement also works since we can always request special orders if we run out in a situation where there was a long weekend or something.”*

5.3 The organisations that were part of the study

In terms of the provisions of the ethical clearance granted for this study, the names of the organisations that have been investigated and the names of the respondents who participated in the study are confidential. However, the positions the participants fill in the organisation and how long they have worked for the organisation was recorded. This is meant to contribute to the validity and reliability of the research that was mentioned in the previous chapter. One dairy company and two retail shops that are serviced by this company was interviewed. One retail shop is comparatively large (conventional supermarket) and the other one is a smaller retail shop that serves as a convenience store. Table 5.1 records the respondents that were interviewed and their positions and years of experience working in that position within the company.

Table 5.1: Summary of respondent profiles

Position held	Gender and years worked
The Logistics manager (dairy company)	Male Has been working for the organisation for the past 10 years
The Operations manager (dairy company)	Male Has been working for the organisation for the past 4 years
The Retail manager 1 (large store/supermarket)	Male Has been working for the organisation for the past 5 years
The Merchandiser 1 (large store/supermarket)	Female Has been working for the organisation for the past 13 year
The Retail manager 2 (convenience store)	Male Has been working for the organisation for the past 8 years
The Merchandiser 2 (convenience store)	Female Has been working for the organisation for the past year

The selection of these respondents used a purposive, judgement sampling method (non-probability) in order to gain information relevant to the study. The respondents, mostly many years of work experience, enabled them to share their perspectives and experiences gained over their years working in the dairy industry, the changes they have witnessed and their anticipation of potential future developments.

The data recorded during the semi-structured interviews has been analysed using a thematic analysis that analyses the transcripts of the interviews by identifying, coding and categorising the data collected. This type of analysis allows for themes to emerge from the data that has been collected. This data is categorised under the themes that they belong to so that they can be better interpreted and presented.

5.4 Analysis of themes

All the themes for this study emerged during the interviews and were developed inductively. The themes were classified into three levels, as follows:

Global themes: A global theme is a macro theme that encompasses a number of organising and basic themes. This theme informs the organising themes as well as the basic themes that emerge from it (Stirling, 2001: 389).

Organising themes: An organizing theme is a theme that categorises the basic themes into smaller groups that speak about similar issues (Stirling, 2001: 389).

Basic themes: basic themes are more informative and reveal what is actually occurring on a day-to-day basis. The organising themes as well as the basic themes all feed into and support the global theme that they fall under (Stirling, 2001: 389).

In this study four main themes, referred to as “global themes”, were developed. These were the nature of the dairy industry and its products, the value-added services that are required, the logistics framework that is required and areas for improvement. Each of these themes has different organising themes or categories and from these categories different basic themes or codes emerged. These codes will be further explained and analysed in the remainder of the chapter in order to identify the relationships between themes and to answer the research questions that this chapter and the study set out to answer.

Table 5.2 lists the themes that were developed inductively from the data that were collected. Basic themes or codes underlie organising themes or categories. Related organising themes were located with each of the four global themes under investigation.

Table 5.2: Categories of themes generated inductively from the data recorded during semi-structured interviews.

Global themes	Organising themes/ Categories	Basic themes/ Codes
The nature of dairy products	Short life span of products	<ul style="list-style-type: none"> • Inventory management • Forecasting • Matching demand and supply
	Cost	<ul style="list-style-type: none"> • Low profit margins • Flexibility associated costs
	Need for frequent deliveries	<ul style="list-style-type: none"> • Daily requisition • Small quantities • Efficiency
Value-added services required	Flexible, responsive operations	<ul style="list-style-type: none"> • Cater for customers' needs • Delivery frequency
	Cold chain management	
	Use of technology	<ul style="list-style-type: none"> • Tracking and monitoring devices • Adoption of EDI
Logistics framework	Enhanced communication	
	Partnering with 3PLs	<ul style="list-style-type: none"> • Monitoring • Improved competency
Areas for improvement	Improved variety and quality management	
	Marketing	

5.4.1 Global theme 1: The nature of dairy products

The factor that became very apparent when the researcher conducted interviews with all the respondents was the nature of the dairy products. This “nature” of the products relates to their short life span and special packaging needs, the special transportation and storage needs as well as the overall competitive nature of this industry. These were seen to be the main contributors and drivers of the manner that the logistics activities are carried out in this industry. The organising themes that came out of this global theme were namely, the short life span of the products, costs and the need for frequent deliveries. These will be further explained in detail below, with the focus on the basic themes that developed.

5.4.1.1. Short life span of products

Dairy products fall into the category of FMCGs which, by definition, are products that need to be moved very quickly through the supply chain. Some of the FMCG products have longer life spans but the dairy products are very perishable and should not spend too much time in storage or in transit (Edwards, 2010: 4). The logistics manager of the dairy company (quoted below) placed a lot of emphasis on how tight their schedule is and how they need to be very efficient in what they do because time is a major contributing factor when dealing with such products. The logistics manager’s exact words were,

“Turnaround time is actually very tight on everything that we do, e.g. fresh milk has a 9 days shelf life; we change the date codes every day.”

- **Inventory management**

It is important for every organisation to produce the required amounts of products for its customers, and to not overproduce. Overproduction is classified in the lean system as waste, as the product incurs costs and may also be spoilt or damaged when it is stored in the warehouse. For this reason inventory management then becomes a very important aspect for the dairy industry. The logistics and the operations manager in the dairy company shared the following:

“When we produce our products we make sure we do not over produce, we look at the season and the period as there are peaks and off-peaks. We plan in advance for so much for a particular season.”

“We cannot manage to overproduce, that would cause us to sit with stock here and also at the retailers, of which this stock is likely to come back to us and we have to dispose of it and give it away to the pig farmers and that is a huge waste.”

“We make sure all we produce gets sold out in the stipulated time frame, but for example with the fresh juice we have got about 6 weeks shelf life.”

“In cases of overproduction, products are discounted at the shop just to push them out because we cannot afford stock returns and we also have to keep up with the competition.”

From the comments and responses reported above it is clear that this organisation needs effective inventory management. This is an aspect of both lean and agile; producing just enough for the available demand is what is expected from a lean or an agile organisation. Stock has to be properly managed and accurate forecasting also assists in such cases. This leads to the next basic theme that was identified and is discussed below which is forecasting

- **Forecasting**

Forecasts are very important for any organisation, even though they may not be entirely accurate and some changes may need to be made. The logistics manager and the operations manager at the dairy company commented:

“It is crucial for us that we do proper planning and forecasting”

“Everything is pre-planned, based on forecasting and we try and accommodate the little variations that occur.”

“The good thing about this industry is that forecasting is normally very accurate; nine out of ten times we get it right.”

Effective management of stock is a result of accurate forecasting and careful planning and is a very important function in both lean and agile organisations. If the dairy organisation was to outsource this logistics activity (forecasting) it would need the 3PL to be very agile and to provide it with up to date, relevant and on time information relating to dairy customers' needs and their order status.

However, accurate forecasting comes at a cost. The next organising theme that emerged was costs. These will be discussed below (section 5.4.1.2).

- **Matching demand and supply**

The operations manager provided some insight into the contracts that the company has with its retailers. The retailers receive the products, but should any products not sell during the stipulated period, these products are returned to the dairy at the dairy company's expense. These returned products represent a substantial loss and cost because the dairy company cannot resell or recycle them; they need to be disposed of.

The logistics manager stated:

“The products returns are our biggest knock.”

“This is a bit tricky, we cannot send less stock because we don't want the retailer to be out of stock since there is too much competition. Our products have to be available to the people at all times, but when we overstock, the returns hit us hard, we just have to find a balance.”

Another organising theme that emerged from this was frequent deliveries. This theme will be discussed below (section 5.4.1.3).

Dealing with product returns and also making sure that they are reduced by the retailers would be one of the biggest challenges for 3PLs. The 3PLs would need to be successful in this regard to make it worthwhile for the dairy industry to use them. The 3PLs would also need to be agile and strategic and use more accurate forecasting techniques in order to assist the dairy companies to match their supply to demand. In order to do this, the 3PLs would also need to be very customer focused and agile in their inventory management techniques so that they were able do much better than the in-house logistics function.

5.4.1.2 Cost

During the interview with the logistics manager he mentioned that his organisation is currently not making enough profit. Thin profit margins, product returns and customer expectations were some of the basic themes that were identified during the interviews.

- **Low profit margins**

The logistics manager mentioned that the profit margins are generally very low in this industry. This could be caused by a number of factors; for example, it could be because of the high level of competition and the small differences between competitors' products. The need for frequent deliveries could contribute to excessive transport costs and so too the high cost of the product returns as mentioned in the previous section. The relative role of these different factors in compromising profits was not clear from the interview.

The logistics manager mentioned a few points pertaining to costs and profits during the interview. To quote from the interview:

“This industry is not making enough profits; we are running on very thin margins.”

“It is better in summer because almost all our products sell very well then.”

“Since we are a smaller company our products are usually a little cheaper than the premium brands because we are targeting a wider audience.”

“This could be another reason we cannot use 3PLs right now, they are very expensive for us to use.”

The costs of production and transportation appear to be very high in this industry yet the products they are selling are not high value products. The high levels of flexibility expected of their logistics also add to the high transportation costs of the organisation.

- **Flexibility associated costs**

Every organisation, whether lean or agile, requires a certain level of flexibility in its logistics operations. However, these levels of flexibility should make financial sense

and should prove mutually beneficial to both the supplier and its customers. The logistics manager seems to be well aware of this, and stated:

“We are very flexible; we make sure that we cater for all our customers’ unique needs but there are times when we have had to decline some customer’s requests because they were not making financial sense to us.”

“Another issue that affects us is that we have to constantly reduce our prices because sometimes the demand is low and sometimes because our products are not moving because our competitors have decided to reduce their prices and have promotions.”

The merchandiser of the smaller company said that:

“We get deliveries every second day and this is okay with us because we understand that we are a smaller company so it would not make financial sense to ask for daily deliveries like the bigger retail shops.”

Regarding the flexibility of the dairy company (Company A), the retail manager of the bigger retailer said:

“Company A is very flexible, even in their prices they are not like the other owners of the premium brands.”

Company A appears to be an organisation that is very accommodating and is very flexible but a problem in the dairy industry seems to be that this compromises their profit margins. This is a serious problem since generally most businesses need to make profits to be sustainable.

5.4.1.3 Need for frequent deliveries

The retail managers emphasised that frequent deliveries are necessary in order for the shop to keep selling fresh products. They stipulated that frequent deliveries also assist by reducing situations such as overstocking, crowding and spoilage of products in their very small storage spaces. From the information gathered, it appears that it is an industry norm that deliveries should be frequent because of reasons such as little storage space and the short shelf life of the products.

The retail manager at the smaller branch emphasised how important frequent deliveries are and how these assist the smooth running of the retail shop and the dairy section.

- **Daily requisition**

The first basic theme that emerged was that the retail customers did not want bulk deliveries. Reasons for this are quoted below. The logistics manager and the retail manager of the smaller retail store shared similar views on this matter:

“Frequent deliveries assist in cutting down on returns and products expiring.”

“Frequent deliveries make control of stock to be much easier.”

“In fact I wish they could deliver more often because they deliver to us every second day since our shop is a small convenient shop unlike the other bigger stores, but this also works.”

“If they were to deliver once a week I would run the risk of obtaining more than enough stock and sometimes being out of stock, so bulk deliveries are not desirable.”

The responses recorded from these participants indicates that frequent deliveries are indeed necessary for proper stock management.

- **Small quantities**

Company A would like to make bulk deliveries only once or twice a week since this may assist them to cut down on their transportation costs. However, this is not likely to be possible because there are many other organisations in the dairy industry that are competing for the same shelf space and storage space.

The retail manager of the larger retail shop mentioned:

“It is important to have frequent deliveries because we have space issues; there is not enough storage space, our storage space is always full with the products from the different competing organisations.”

“Frequent deliveries make control of stock to be much easier even in the retail shops.”

The operations manager also added:

“They informed us that they don’t have enough space for many product customers, if it was for us really we would deliver once or twice per week, but that could result in the increase of the product returns.”

This information indicates that it is imperative for company A to make frequent, small deliveries even though the logistics costs are higher. The nature of the products and the competitive landscape of the industry they are operating in now requires this.

The 3PLs may struggle to take over the very efficient system that companies such as company A currently operate. They would have to identify the challenging areas for improvement and devise ways of being similarly, or more, efficient and effective; they would have to originate new ways of doing business. Companies in the dairy industry are looking for efficiency, effectiveness, agility and innovative ways of doing business that will enable them to gain an advantage over their competitors.

- **Efficiency**

With the present hypercompetitive nature of the dairy industry, dairy companies have to focus on high levels of customer service and responsiveness. Company A strives to maintain a high level of responsiveness and all its logistics operations are focused on its customers. The logistics department of Company A received praise from the merchandisers and store managers of the retail shops. The company is said to deliver to the larger retail store every morning around 06:00 am without fail. If a number of products are damaged, the logistics department makes arrangements to rectify the issues before midday.

The logistics manager contributed the following comments that provide an insight into the level of responsiveness that their logistics system is able to extend to customers:

“We have warehouses in areas that are far from here and also in other provinces we have warehouses and other branches. The warehouses are not used to store products but are used for break-bulk purposes; these are used as cross-docks.”

With reference to the cross-docking that the company employs, he commented:

“We cannot afford to have warehouses that store our products. Once they leave us they have to go straight to the customers, the time factor is very important hence we don’t have any other warehouses but use cross-docking places instead.”

“We respond to the needs of our customers as long as we have the means to do so.”

The retail managers and merchandisers of both the shops shared the following views:

“I would say that the use of in-house transportation makes it even more efficient because there is no middle man.”

“I would say company A takes the lead when it comes to being efficient.”

“The option of being allowed to place special orders makes things much easier.”

“The products are always delivered on time. When we get here in the morning we sometimes find the truck drivers outside waiting.”

“Company A’s turnaround time to rectify problems is amazing compared to the competitors in the market.”

To change from in-house logistics services, 3PLs would have to deal with the frequent and timely deliveries that the retailers require and deal with the products that cannot be warehoused and require cross-docking. They would need to be prepared to work around the clock and to really understand their customers. The 3PLs are likely to face the challenge of planning economical routes and having to develop very close relationships with both the retailers and the dairy manufactures. A winning 3PL would have to achieve integration of the entire supply chain and be able to work as if one organisation in order to succeed in this industry.

5.4.2 Global theme 2: Value-added services required

In order for an organisation to stand out in a very competitive industry that has limited to zero actual product differentiation, the organisation needs to find something that will

be value-adding towards its customers (Chenatony, Harris and Riley, 2000: 43). Flexible, responsive operations, cold chain management and the use of technology are the themes that emerged from this global theme.

5.4.2.1 Flexibility and responsiveness towards customers

Throughout the interviews flexibility and responsiveness were strongly associated with company A's performance and its manner of doing business. This ranged from the flexibility of deliveries and order quantities to the flexibility of prices. The basic themes that were mentioned have been categorised as the following two themes:

- **Cater for customer's needs**

The review of literature described how any organisation that seeks to be successful in what it does needs to be customer focused. Similarly, a customer focus was cited as one of the most important features of an agile company. Therefore, it was not surprising that the respondents associated with Company A suggested that flexibility and responsiveness were one of the major order qualifiers in the dairy industry. The views of the logistics manager, operations manager, the two retail managers and merchandisers regarding the customer responsiveness of the logistics department follow.

The logistics manager shared the following:

“We have figured that in this industry, in order for us to survive we need to cater for customers' unique needs and bear in mind that with our retailers, providing flexibility is an order qualifier.”

“We deliver every day to our bigger retail customers and every second day to other smaller customers. See we cannot standardise things, we look at each customer's needs and deliver accordingly.”

“We have a shop representative that regularly visits our customers to speak to the retail manager and merchandisers about that particular organisation's needs and we deliver.”

“Our customers are allowed to place orders at any time 7 days of the week.”

“The organisation has identified a gap in the market; we are completely customer focused which is something that the bigger companies in this industry still need to work on.”

“In order to make sure that the organisation caters for all the customer’s needs and still makes profits the logistics department tries by all means to be economical by servicing certain areas at the same time, hence saving time as well as transportation costs.”

“Since most of the deliveries are made early in the morning the organisation is able to detect early if there are any problems and if there are any, these can be rectified as soon as possible, depending on the seriousness of the issue.”

“Demand forecasts assist the organisation to pre-plan. It’s a good thing that this industry to some extent is very predictable so we plan in advance what we expect to sell and it is usually a little more or less of what the actual demand is.”

“Responsiveness is the key focus when dealing with the retailers.”

The retail manager at the bigger retail company said:

“We like company A because they are very flexible in terms of their deliveries and prices.”

The merchandising lady at the smaller retail company mentioned:

“We can even make special orders if they are not delivering on the next day and we need some products, they make sure that they come and deliver.”

The use of a shop representative in addition to the merchandising people that are available in the retail shops seems to work very well for company A. They are well aware of what is going on in terms of their products and their competitors’ products in the retail shops and they can act accordingly and cater for each customer’s needs.

The retail managers and merchandisers shared the following sentiments:

“I always feel that unexpected variations in demand are accommodated, the shop representative can be reached at all times and attends to us as soon as possible.”

“I don’t think they should outsource logistics. They are currently doing a very good job, giving it to someone else may cause problems between us and the retailers.”

“This dairy company has no choice but to be responsive. The competition in this industry is very high and customers are not really loyal to one company so products must always be available when needed.”

“Compared to their competitors they are the most responsive and flexible.”

“The shop representative is always just a phone call away.”

“Company A has better stock rotation.”

This reflects that the organisation is customer focused and it does all that it can in order to meet the customers’ needs as long as it is within their scope and it is economically feasible to do so.

Using 3PLs would require the 3PLs to understand each of the customers that the dairy company deals with, and identify all of their logistics needs and what it is that they value the most. This would assist the 3PLs to focus on providing the customers with the products and value-added services they need.

Understanding the customers and focusing on their needs is what will make 3PLs successful in this industry. These third parties would have to at least match or provide over and above what the in-house logistics department is currently doing.

- **Delivery frequency**

The logistics manager mentioned that they have observed that when they focus on being flexible, in terms of delivery times, quantity and price, they tend to sell more products than the competitors. For this reason, company A has since decided to capitalise on this and not reduce the delivery frequency. The company has also realised that if it was to make bigger deliveries, made once or twice a week, this would restrict their level of flexibility. The following statements were expressed by the respondents in this regard.

The logistics manager mentioned:

“As company A, we have taken it very seriously that the organisation wants frequent deliveries, so this is what we are about. We are always doing our best to make sure we cater for their needs.”

“We would like to deliver once or twice a week per store but we cannot. Reducing our delivery frequency would hinder our flexibility.”

The merchandiser at the smaller retail company mentioned that

“They have to deliver frequently so that stock can be properly managed and this assists because we can tell what is selling and what is not selling and we can make appropriate orders and not waste money.”

Frequent and small delivery seems to be crucial in this industry and company A has concluded this and appears to have gained a “competitive advantage”. In addition, the quality of the products that are being delivered is critical. Proper management of the supply chain is therefore essential.

5.4.2.2 Cold chain management

Cold chain management is a fundamental activity in the supply chain management of dairy products. If this area is neglected or is not taken as seriously as it should be it could result in products reaching the retail shops in an unusable condition. Achieving an effective cold chain is mandatory when servicing the dairy industry.

The logistics manager provided an overview of how their cold chain system works. He mentioned that they receive milk from farmers every day and it is transported to them in insulated trucks that maintain the milk in the state that it is received in (same temperature and without being contaminated). He then mentioned that this milk is pumped into insulated silos that keep the milk at the same temperature. This milk is then drawn from the silos and enters the processing and packaging line.

The finished goods milk products are stored in the in-house warehouse awaiting transportation and distribution by trucks that are also refrigerated. This end-to-end cold chain ensures that the quality of the products is maintained.

Some of the logistics manager’s comments were:

“We keep our products under the required temperature until they reach the retail shops and it is up to the retailers to keep these products in the right condition.”

“Our cold chain is on point. We don’t compromise on that because we know that our products need to maintain a high quality.”

The operations manager added:

“The cold chain of the organisation is proper, as the product reaches the shop shelves in the same state that it was in when leaving this department.”

The merchandising lady at the bigger retail shop said:

“We are happy with the state that we received the products in, we don’t have any problems.”

Maintaining an effective cold chain is very important for products such as dairy products and company A seems to be able to maintain its cold chain very efficiently. The quality that the products are kept in adds value to the reputation of the products of company A and, again, 3PLs would need to maintain or improve on this quality of products that are delivered to the retail shops. A 3PL would have to convince the dairy companies that it could provide even more value for them and be able to contribute to a competitive advantage to gain more business. Maintaining the cold chain of the logistics systems is assisted by introducing efficient technologies. Some of these technologies are discussed below.

5.4.2.3 Use of technology

Company A has invested heavily in technologies over the past few years in order to become more efficient, flexible, responsive and customer focused. The company has installed tracking and monitoring devices and electronic data interchange (EDI), in order to improve the efficiency of the supply chain by being able to transfer more timely information.

- **Tracking and monitoring devices**

These are very helpful devices that company A uses in order to track and trace its trucks in order to prevent them from being stolen and to prevent the drivers from running their

own errands using company vehicles and time. They also assist the company to monitor if the drivers are experiencing problems such as accidents or hijacking on the road. The logistics manager mentioned:

“Over the past few years we have implemented systems and technological devices that assist us in maintaining quality, obtaining efficient communication, tracking and tracing our trucks and also to maintain temperature within our silos where our milk is stored.”

“The tracking devices assist us in tracking the drivers and the routes that they are taking. We don’t want them running their own errands with the company’s resources. This also assists us to monitor our running costs.”

As indicated by the logistics manager, these technologies can be used to monitor costs and delays and the company can then work on improving its performance. Introducing a 3PL that has the expertise and resources to exploit these technologies should benefit the dairy industry greatly. A number of performance metrics could be monitored. Where the most time is wasted, where and when traffic is heavy and when and how it can be avoided, delivery times at the retail shops and similar metrics.

The dairy company also uses a temperature monitoring system called the Ekhaya system. The operations manager discussed the use of this device in the production process and in warehousing/storage space:

“The Ekhaya system is used to monitor the quality of our products by monitoring the temperature in our milk silos.”

“This system assists us to ensure that the required temperature standards for our products are met so that we can maintain the required level of quality.”

The logistics manager also added:

“We use the Ekhaya systems to make sure that our products are kept in good quality so that when we send our products to our customers we can send them with confidence.”

- **Adoption of EDI**

The Electronic Data Interchange system is used within the organisation for efficient communication. The operations manager expressed his appreciation for the system with these words:

“EDI is used within the organisation to update orders, deliveries and production so that every department is aware of what is going on.”

“The EDI system works very efficiently because the sales department updates the system and we in operations receive the orders and we know how much of what to produce for the next delivery.”

Efficient communication is very important in the development of efficient, cost effective and agile supply chains. Achieving an efficient communication system enables a company and its supply chain to become more agile and customer focused.

Technology is a widely used, effective tool to differentiate businesses and make them more efficient through the use of real-time information, efficient operations, and customer focused initiatives. This is the objective of agility too. Matching the dairy industry in this regard may be a challenge that 3PLs in the dairy industry will be faced with.

5.4.3 Global theme 3: Logistics framework

The logistics of bringing dairy products to market are quite different from most of the products in the FMCG market since they require storage and transport in controlled and highly monitored environments. During transportation these products have to be transported in special vehicles that are designed specifically for products of this nature. The special attention doesn't end with transportation but extends to packaging and storage of these products. One of the other very important needs of the industry is efficient and responsive ways of communicating which is further explained below.

5.4.3.1 Enhanced communication

According to the responses that were received from the respondents it appears that the retail managers and merchandisers feel that communication is now much better than before:

“If there is fault with products a report is sent back with the drivers.”

“There is constant formal and informal communication between the parties.”

“The line of communication is very adequate. We have no problems in that area because even the drivers when we send reports with them they give them to the right person on time.”

“From the times we started working with them till now, they have improved a lot and we have also improved a lot in terms of on-time communication.”

“Communication with the shop representative can be about anything ranging from product requests, promotions and changes in demand or product returns. Communication has overall improved.”

Efficiency in communication, production and logistics increases the agility of the company. Implementing direct lines of communication between the relevant parties increases the speed and effectiveness of communication. Logistics and product monitoring is also improved when communication is effective.

5.4.3.2 Partnering with 3PLs

As was considered in the literature review, there is a strong tendency in business to outsource activities such as logistics to outside parties that are competent in these areas in order to focus on core business activities. However, closer examination of certain situations may indicate that this is not an easy task and it may actually be better to perform these activities in-house. The responses from the logistics manager regarding this matter are:

“We would appreciate the more advanced services that may be offered by 3PLs but an attempt to use 3PLs failed when they told us that they cannot match our running cost. They were asking for way more than what we were willing to pay them.”

“At this point in our business, honestly, it is better to use our own logistics department since we can easily monitor our operations, we can see where money is wasted and save where we possibly can.”

“What we do, is that in periods of very high demand when we find that we cannot service all our customers at once, we use hired trucks. They are much better than using 3PLs since we only use them when we need them and just pay that fee that they charge us. There are no other costs involved after that.”

“Chances are if we were to ask 3PLs to offer these services for us they will charge us more and they may not be pleased with the level of flexibility that we may require from them.”

“The use of 3PLs usually requires a lot of work, and since they have proven to be more expensive when we approached them we will stick to this plan.”

“The use of hired trucks gives us flexibility because we only hire them when we need them and only pay for that occasion and we have no binding contracts with them.”

The operations manager observed:

“The logistics department seems to have things under control, I don’t see the need for 3PLs.”

The retail manger and merchandisers said:

“We are very happy with the way their deliveries are done as well as their turnaround time when we place special orders.”

The sentiments of these respondents suggest that the present alternatives to using 3PLs are working very well for the dairy industry. With flexibility and responsiveness considered order qualifiers in this industry, Company A and similar companies may be expected to remain sceptical of using 3PLs. There is a fear that 3PLs will not be able to maintain the industry’s current standards and that the extra fees charged for these services will not be economically viable.

Presently, the dairy industry does not see value in using 3PLs and this outlook may be expected to persist. Company A believes that it is able to do all that the 3PLs are offering, but at a very much lower price. In future, if 3PLs want to enter the dairy industry they will have to justify their existence in the dairy industry and be able to provide substantial evidence that the costs of outsourcing are justified. At this point in time this is what 3PLs have seemingly failed to do. Over the coming years 3PLs may be seen to be capable of introducing innovative ways of doing business and adding value to the dairy companies that they provide services to. Until this stage is reached, 3PLs will not be seen as relevant in the dairy industry because the provision of basic logistics services is no longer regarded as value-adding.

- **Monitoring**

Products are monitored closely in Company A; the operations department works very closely with the logistics department to always ensure that they have stock that will last for up to 4 days. This is done in order to be able to accommodate any unforeseen situations such as strikes, load shedding, or any unexpected rise in demand, accidents or damage to products. The carrying of stock also happens because the milk suppliers to the dairy company deliver milk every day. Therefore, the company has to keep producing. The situation where the company ends up having more stock than required for the day results because the demand may vary but the quantity of milk received from the farmers' remains the same in the short term.

The logistics and operations manager spoke briefly about product monitoring and logistics. They spoke about tracking the truck drivers in order to make sure that they don't waste fuel going off route or making unnecessary stops. This is also to ensure that drivers get to the retail shops on time and that they return with the crates and returned products on time. The logistics manager stated:

“The logistics department has no choice but to monitor products and logistics and also be responsive.”

“Drivers are tracked when they are going off route because that kills the company in terms of time and resource management.”

The logistics manager emphasised the importance of the issue of monitoring the products and the drivers of the trucks. The reluctance to use 3PLs may, in part, be due to the perception that control would be lost in the process.

5.4.4 Global theme 4: Areas for improvement

After the respondents had provided opinions and insights into the manner in which the logistics activities of company A are managed, they then provided information regarding what they consider will be important in future. This includes their assessments of possibly important areas for improvement within the industry and within company A. This information assists with the deliberation of a potential need for agile or leagile 3PLs for the dairy industry. The suggestions contributed to two themes.

5.4.4.1 Improved variety and quality management

The retail shop respondents commented on the variety and quality of products that company A is selling and seemed to suggest that it may be lagging in this regard when compared to certain other companies in the industry.

The retail manager at the smaller shops said:

“They need to increase their variety and the range of their products.”

The merchandiser at the smaller retail shop said:

“I just have a problem with one product that I believe they should change. It expires before time and sometimes bursts open on the shelves.”

The merchandiser at the bigger company said:

“We need stronger packaging especially with the milk that is in sachets because we find that we return a lot of those products not because they are not fresh or out of date but because the packaging is weak and the product easily gets spoilt or the pack gets torn.

“The milk packaging in particular is very weak compared to the other premium brands that we have in the store.”

The retail manager at the smaller retail shops said:

“They must improve quality of their products in terms of taste and their shelf life.”

“They must also improve their sell by dates.”

“The taste of company A’s product is different from that of the premium brands especially if you open it and don’t finish it for a day or two. On the third day it starts to really taste bad.”

From the information gathered it is clear that Company A needs to pay more attention to the quality of some of its products, the variety of the products and the packaging of some of their products.

5.4.4.2 Marketing

An added recommendation that was mentioned by the retail manager at the smaller retail shop was that company A needs to be more visible. He states that the company needs to advertise more on the available media platforms so that a lot more people may become aware of and recognise the brand:

“They should also look at advertising more on radio and television, etc. in order to create awareness.”

“They should also improve on their sell by dates.”

Some of these proposed areas for improvement do not refer directly to logistics and are not seemingly linked to the objectives of the study. However, this information is considered important and will be discussed in the conclusions to this research.

Earlier responses presented in this chapter tended to portray Company A as highly successful in its logistical operations. However, the evidence given above suggests that although the organisation is currently satisfying its customers’ needs in terms of responsiveness, flexibility and being customer focused, it still has to address issues such as packaging and the quality of its products.

That there are areas where Company A is lacking suggests that there may perhaps be scope for outsourcing of logistics activities to 3PLs in order to provide the company

with sufficient time and resources to develop and expand. The time and resources could be used to improve the quality and the variety of the brand and to focus more on marketing the brand. A 3PL may also provide more opportunities to develop value-adding services for the dairy company since logistics is their area of expertise.

5.5 Conclusion

The opinions and perspectives of the respondents interviewed in this study indicate that the logistics department of Company A is currently very efficient, flexible and responsive towards its customers' needs. The question remains; can 3PLs provide more cost effective solutions? Is there a need for 3PLs in the dairy industry and what challenges would the 3PLs face if they were to enter into this industry? The following chapter will present certain conclusions in this regard.

CHAPTER 6: CONCLUSIONS

6.1 Introduction

The objective of the research reported in this dissertation was to assess the demand for agile/leagile third party logistics services in the dairy industry. As described in the previous chapters, these objectives have been met and certain conclusions may be drawn. These conclusions and recommendations are explained below.

6.2 The need for 3PLs in the South African dairy industry

The first objective defined in this study was “*to assess the type of service currently offered by South African 3PLs serving the dairy industry*”. The investigation of Company A and additional online desk research indicated that there is currently little use of 3PLs in the SA dairy industry. From the information gathered, the researcher determined that the dairy industry, in particular company A, appreciate the advantages of inviting 3PLs to deal with the stresses of delivering, cross docking, packaging, tracking and tracing products, investing in and managing vehicles and other dedicated logistics activities. However, Company A believes that at the present time it can maintain lower costs and even possibly do a better job since it has been performing these activities itself for a very long time. To a certain extent, the management respondents from Company A agree that even though they are currently doing a good job they aren't experts. Their lack of knowledge and experience may very likely limit them in the near future.

Using 3PLs will then free the dairy companies to focus on their core competences. For a company like company A, where their customers are very concerned about the shelf life of the products and the packaging, the use of 3PLs will provide Company A with more time and resources to focus on these issues. Management could investigate factors such as improving the taste and shelf life of their products in order for them to be able to compete with the premium brands. The services need to be tailored to customers' needs and the 3PLs need to be very responsive and flexible when responding to different customers' needs.

6.3 The need for 3PL agility in the South African dairy industry

The second objective defined in this study was “*to determine the extent to which the dairy industry in South Africa requires agile services from 3PLs*”. Whether the logistics activities are performed in-house or by 3PLs, the research indicated that the most important logistics requirement is agility. This is attributed to the nature of this industry and is certainly how the internal logistics department of Company A is carrying out its logistics activities now. Combining lean and agile would be the best solution, since cost is an important consideration in a hypercompetitive market, but it appears that the industry requires more agile than lean activities presently. Therefore, 3PLs wishing to enter the dairy industry will have to be leagile or at least agile in order to meet both the retailers’ and the manufacturers’ needs.

The fact that these products cannot be kept for long in warehouses or in transit and also since the retail customers require frequent deliveries underlines the need for agility in this industry. One can also assume that if there are any dairy companies that are being serviced by 3PLs, those 3PLs are very agile. They might not compare to the services delivered by company A’s logistics department but some level of agility is needed given the nature of the products and the industry they operate in. The services need to be tailored to customers’ needs and the 3PLs need to be very responsive and flexible with regard to the different customer’s needs.

The short life span of the products, the small storage and shelf spaces available in the retail shops as well as the demand for fresh products by the final customers determines that the dairy industry is an industry that needs agility in its logistics. This agility is not only limited to transportation but also applies to other aspect of logistics such as inventory management, warehousing, efficient communication and efficient and regular use of technology. All these activities require an agile strategy.

A critical feature of the dairy industry is that it is an industry with products that are all very similar and most customers show little brand loyalty when buying a packet of milk or container of yoghurt. With high levels of competition within the dairy industry 3PLs would need to be customer focused and able to operate with high levels of flexibility. Lean may be implemented to reduce costs but Company A stated very clearly that these days an order qualifier with the retailers is flexibility and responsiveness.

6.4 The challenges and level of difficulty 3PLs face implementing agile or leagile in the dairy industry

The third objective defined in this study was “*to assess the level of difficulty that 3PLs are likely to face when they provide agile or leagile services for dairy companies*”. The fourth objective of this study was “*to identify the specific challenges that 3PLs face when attempting to implement agile strategies*”. These two objectives will be considered together in the following discussion and in decreasing order of level of difficulty.

The Logistics manager of Company A mentioned that the biggest reason why they are not using 3PLs currently is because when they approached 3PLs they proved to be more expensive than their internal logistics department. This is a challenge that 3PLs may face or could be facing currently when attempting to provide the services required by dairy companies. Several factors may contribute to this situation. As the respondents described, there is considerable competition in the industry and consequently the dairy companies are operating with very thin profit margins. On the one hand are smaller dairy firms focussed on providing cost effective, individual customer service and on the other are larger firms that enjoy scale advantages that enable them to provide high levels of slightly different customer service. Any 3PL attempting to provide agile or leagile services to the dairy industry will experience high levels of difficulty attempting to provide cost effective logistics services equivalent to the existing dairy company services.

The second major challenge 3PLs may expect will be keeping up with the retailers and the dairy company in terms of information sharing. Keeping the lines of communication shorter increases the level of efficiency whereas adding another stakeholder may be expected to reduce speed and increase miscommunication. Complexity will increase as a common communication platform and compatible systems will be required by the three groups. This may be extremely difficult to achieve in practice when a lot of parties are involved. Communication breakdown as well as inconsistencies in communication are likely to occur with more parties being involved in the supply chain. Overcoming this challenge will prove very costly too. The operations manager and the logistics manager of Company A also expressed a fear of losing control and their relationships with the retail shops. Direct communication serves to maintain the relationships.

Any 3PL entering this industry may find it difficult to keep up with the level of flexibility that company A is currently offering to the retailers. Company A is currently very flexible and is pushing more boundaries in order to service the companies. They are doing this disregarding the short-term costs and focussing on the long term benefits instead. The 3PLs are in the business of making profits and performing in the short term. The 3PLs will have the challenge of very demanding clients and customers who are not in a position to pay them enough for them to bend over backwards and service them every day and sometimes twice a day (when there are unforeseen events). The reverse logistics may also bring challenges. A number of factors were identified that impact on reverse logistics with the operations manager at Company A even complaining about the late return of crates. Adding a “middle man” to an already complex system will present challenges of its own, in terms of reverse logistics.

Finally, the dairy industry, by its very nature, is highly fragmented. There are a large number of medium to small dairies all serving a comparatively small number of retail chains. The retailers appear happy with the *status quo* as they are able to play one dairy company off against another whilst receiving high levels of customer service and responsiveness. A 3PL that is large enough to enjoy the scale economies necessary to compete in the 3PL industry may prove too large to cater for the needs of relatively small dairy companies and so not be interested in this type of business from the outset.

6.5 Future developments in dairy and 3PL relationships

The fifth and final objective of this study was “*to identify future developments desired by the stakeholders in the dairy industry i.e. the dairy companies, the 3PLs and retail customers*”. A major finding of this study is that the dairy industry, presently, is not an economically viable prospect for 3PL services. However, an intervention may be what the dairy industry needs. As mentioned in the discussion in the previous chapter, 3PLs have the potential of turning things around for the dairy industry by providing them with services that will gain them a competitive advantage and make processes more efficient. The 3PLs are also capable of bringing in services that the existing companies in this industry have not tapped into.

The increased potential role for 3PLs is soon going to influence African markets. Many industries, such as the dairy industry, are likely to seek 3PL services that will assist

them to be even more responsive, flexible, agile, relevant and competitive. This is because the existing organisations and their supply chains lack the knowledge, expertise, experience and technologies that 3PLs have and are likely to add to as the 3PL industry continues to grow in this country.

South Africa is yet to experience the full value-added services that 3PLs can offer, across all industries, which will contribute to gaining a competitive advantage. This advantage can be assisted further by allowing the dairy companies to focus on their core activities thereby providing them with a better opportunity to produce excellent products. The 3PLs can also assist the dairy companies to gain a competitive advantage by servicing customers in a more responsive and agile manner in areas where the dairy companies aren't achieving at present. The 3PLs can act as an extended part or unit of the organisation to provide efficiency in communication, better warehousing, improved reverse logistics and packaging innovations that reduce weight and waste and are easier to use. In order for the dairy industry to be able to gain these benefits they need to realise that there are many services, other than the basic logistics services, that they can gain from 3PLs.

The 3PLs also need to provide these organisations with good reasons why they should outsource their services to them. They should be able to provide them with something that they are not able to provide for themselves in-house and this activity should be of great benefit to the organisation and add sufficient value to be economically viable.

The literature that was reviewed also shows that in other countries outside Africa the use of 3PLs is very high. These 3PLs provide their customers with value added services other than basic warehousing, transportation, tracking and tracing and reverse logistics. However, in the South African context the expectations are currently still very low and basic. Looking into the future, it appears that the overall use of 3PLs in South Africa is yet to grow. The move from a focus on only providing the traditional activities to offering more value added services such as supply chain visibility, better space utilisation, traffic flow, SKU rationalisation, collaborative planning, forecasting and replenishment is necessary. Value-added services are the future for 3PLs in South Africa.

6.6 Conclusions

In conclusion, lean, agile and leagile are very important strategies that an organisation may need to implement in order to remain competitive. However, the challenge is to determine the correct strategy to implement and how it should be implemented. The organisation also needs to make sure that it communicates the strategy that it currently implements to its suppliers, employees, third party providers and its customers.

The dairy industry has evolved over the past few years with end customers exerting a substantial influence too. Customers have become more health conscious and their increase in buying power and higher levels of education have made them very particular about what they buy and how healthy and fresh the items that they buy are. This has placed the dairy companies, in particular, in a difficult position. With lower returns and strong competition in the market, dairy companies have to ensure that they provide the right products, in the right place, in the right quality, at the right price and in the right condition.

The short term scenario for dairy companies is not encouraging or sustainable. To remain competitive the dairy companies are forced to provide swift and responsive customer service. These high levels of service and responsiveness are differentiators but their provision is often not cost effective. A likely trajectory for the industry is extensive rationalisation with large numbers of mainly small dairies forced out. Subsequently, prices will inevitably rise; there will be a de-proliferation of SKUs and fewer large dairies, implementing lean, will prevail.

There is no incentive for the retail groups to alter the *status quo* and the win-lose relationship that exists in their favour. However, there is an opportunity for a third party to enter the industry and to generate a win-win for all parties concerned. Individual dairies are constrained by comparatively level production but fluctuating demand. As an individual enterprise in this market it is difficult to accommodate these movements cost effectively. However, these market movements can be forecast relatively accurately and a competent 3PL would be better able to coordinate overall supply and demand across a wide geographic area to exploit seasonal, product variety and other factors. The 3PL can't succeed without both the supplier and retailer also succeeding.

The supply chain model described above is not entirely new; the intended role of state endorsed industry “Control Boards” in the past was to do just this. In practice, the Dairy Board was neither lean nor agile as political and other influences, rather than market forces, directed decision making. The extra value add that one or more 3PLs would be able to contribute would arise from their central, coordinating role in the dairy supply chain. They would be able to rationalise the number of competing brand SKUs and target the different LSM segments more effectively. With appropriate data mining tools and ready access to POS information they would be able to mount more effective marketing campaigns. Finally, since improving the efficiency and effectiveness of logistics is the dedicated role of a 3PL, they would be able to focus on packaging innovations, cost and lead time reductions through cross-docking, and a range of other innovative initiatives.

The value adding role for 3PLs in dairy supply chains is fertile ground for further research.

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APPENDIX A

Interview Guide 1: Dairy company Logistics Manager

SECTION 1: GENERAL INFORMATION

1.1 Name of company: _____

1.2 What is your current position in the organisation? _____

1.3 When was your company established? _____

2. How many employees are employed in the company? _____

Which of the following best describes the status of the company you work for?

STATUS

Head office

Holding company

Branch

Subsidiary

Independent unit

SECTION 2: LOGISTICS QUESTIONS

Questions for the 3PL or Logistics department at the dairy firm

- 1. Do you consider that the needs of your dairy market are highly predictable or are they constantly changing?**
- 2. When dealing with your products, does the short life span of these products require special consideration?**
- 3. If this does, then what sort of measures do you have in place in order to make sure that the products do not spend too much time in transit and reach the customers ASAP?**

Responsiveness

- 4. To what extent does your market demand responsiveness and short-term availability of products?**
- 5. Does the company use set delivery intervals and perhaps quantities or is a more flexible system offered?**
- 6. Do you consider that your response time to customer orders is optimum or do you feel there is still room for improvement?**
- 7. Do you consider response time as the most important characteristic within this industry or are there other aspects such as flexibility, cost saving or waste reduction that are prioritised?**

Cost

- 8. Are your customers in the dairy industry moderately or extremely cost sensitive? i.e. are they willing to pay for responsiveness and flexibility; do they ask for quick deliveries and are they willing to pay extra for them?**
- 9. Based on your knowledge of the dairy industry, are the margins in your market narrow or is there scope for reasonable profits?**
- 10. Do you consider that the dairy industry market involves the movement of predominantly high or low value items?**

- 11. How important and costly are the inventory holding costs of buffer inventory held in order to be able to respond to any unexpected changes in the markets?**
- 12. To what extent would reductions in buffer inventory affect the level of service delivery?**

Value-adding services

- 13. Do you consider that in order to satisfy your customers you need to provide more customised services or are fewer standardised services adequate?**
- 14. What service level features do you consider are order qualifiers (the essential “must have’s”) when dealing with your customers? What potential order winners can you describe?**
- 15. How successful is the logistics department at maintaining a cold chain?**

Flexibility

- 16. Does the company experience any problems trying to meet the volatile needs of the market?**
- 17. Does the company experience any problems when attempting to standardise the services offered?**
- 18. Is the emphasis of your supply chain more on achieving economies of scale (getting more done at lowest possible cost) or flexibility?**

APPENDIX B

Interview Guide 2: Dairy company Operations Manager

SECTION 1: GENERAL INFORMATION

1.1 Name of company: _____

1.2 What is your current position in the organisation? _____

1.3 When was your company established? _____

2. How many employees are employed in the company? _____

Which of the following best describes the status of the company you work for?

STATUS

Head office

Holding company

Branch

Subsidiary

Independent unit

SECTION 2: LOGISTICS QUESTIONS

Questions for the operations manager in the dairy firm

1. Is your company using Third Party Logistics Providers (3PLs) for any of its logistics services?

Yes (move to question 2, 4 and 5)

No (move to question 3 and 4)

2. Which logistics services have you outsourced to 3PLs?

3. Why does the company not use 3PL services?

4. Do you foresee yourself using 3PLs in future?

5. Out of all the services that the logistics department provides, which one has proved to be of the most benefit to you during times of unexpected demand?

Responsiveness

6. To what extent are you satisfied with the lead time that your 3PLs or logistics department provide; do you consider that this lead time should be reduced further?

7. How accurate are your demand forecasts at forecasting orders and production in a week or month? Do you believe the results of your demand forecasts are satisfactory?

8. What contingency plans do you as the business have in terms of making sure that you have back up or buffer inventory for situations where demand has not been accurately forecast?

9. In terms of being responsive to customer orders, what is it that you believe that your 3PL/logistics department should change or improve on in order to better accommodate your specific needs?

10. On a scale of 1 to 10, 1 being poor and 10 being excellent, how would you rate the responsiveness of your 3PL or logistics department?

11. What challenges have you faced as an organisation when attempting to be more responsive to your customers?

12. What do you feel that the 3PLs or the logistics department should be doing in order to be more responsive in delivering the orders that your department has prepared, i.e. what would you like to see in the future?

Value-adding services

13. In the past 5 years have the services offered by 3PLs or the logistics department changed?

14. If the services in (Question 13) have changed, how have they changed?

15. Does your logistics department or 3PL use technological tools such as EDI, RFIDs and the internet for communication and providing real time information?

16. How often are such technological tools (described in question 15) used by you and your logistics department/3PL?

17. On a scale of 1 to 10, 1 being poor and 10 being excellent, how would you rate the services of your 3PL or logistics department?

18. What challenges have you faced as an organisation when trying to provide more value-added services for your customers?

Flexibility

19. Are you always accurate in terms of your demand forecasting or are there sometimes variations?

20. If there are variations how big are they?

21. How do you then accommodate these variations?

22. Do you find that the logistics department or 3PL is always prepared for alterations in terms of the times or amount of inventory that you forward to them for delivery?

23. Do you find that your 3PL or logistics department is able to make small and frequent deliveries when necessary?

24. Is there any form of product postponement (where some features of the product are only added upon customer order) that is done within the logistics department or by the organisation's 3PLs?

- 25. Do you believe that the logistic department or 3PL is flexible enough to accommodate any unexpected changes in the industry or customer orders?**
- 26. What challenges have you faced as an organisation when trying to improve responsiveness (such as changing order quantities or other specifications) in order to provide your customers with increased flexibility?**
- 27. In terms of flexibility, what is it that you believe that a 3PL should change or do better in order to accommodate specific customer needs?**
- 28. Many people would claim that it is cheaper to use 3PLs, especially in transportation, than having your own trucks since you can avoid the capital investments and other responsibilities that come with having your own transportation system. What is your view on this contention?**

APPENDIX C

Interview Guide 3: Retailer Manager

SECTION 1: GENERAL INFORMATION

1.1 Name of company: _____

1.2 What is your current position in the organisation? _____

1.3 When was your company established? _____

2. How many employees are employed in the company? _____

Which of the following best describes the status of the company you work for?

STATUS

Head office

Holding company

Branch

Subsidiary

Independent unit

SECTION2: LOGISTICS QUESTIONS

Questions for retail managers

Responsiveness

- 1. On a scale of 1 to 10, 1 being poor and 10 being excellent, how would you rate the relationship that you have with company A in terms of the deliveries?**
- 2. What makes you give this rating?**
- 3. How often are Company A's deliveries on time?**
- 4. When unforeseen circumstances occur, how quickly do you get the products delivered or reverse logistics activities provided in order to deal with the situation? Please may you describe any differences that may exist between company A and other companies in the dairy industry in this regard?**
- 5. Do you always receive products from company A in a desired state and of appropriate quality?**
- 6. Considering the dairy companies that you deal with, which ones prove to be more efficient; the ones using 3PLs or the ones that have their logistics in-house?**

Costs

- 7. To what extent do you consider your customers to be cost sensitive i.e. are they more inclined to show brand loyalty or more likely to respond to low price "specials"? Are there differences between different dairy product categories?**
- 8. Is your priority to receive bulk deliveries that minimise costs, or to receive smaller, more frequent deliveries, that cater to your customers' immediate needs?**

Value-added services

- 9. Has your supplier's level of service provision changed in the past five years? (Particularly logistics services)? If yes, how have these services changed?**
- 10. What would you suggest to your dairy providers that they should change?**
- 11. Do you find service delivery levels of all your different dairy companies to be the same or is there a range in efficiency and responsiveness?**

- 12. Compared to others companies in the dairy industry, how would you rate the efficiency and responsiveness of company A (which is the dairy organisation that this study is centred on)?**

APPENDIX D

Interview Guide 4: In-store merchandiser

SECTION 1: GENERAL INFORMATION

1.1 Name of company you work for:

1.2 What is your current position in the organization? _____

1.3 How long have you working for this company as a Merchandiser? _____

SECTION 2 : Logistics questions

Questions about the work of a Merchandiser

Communication

- 1. Who do you communicate with to request products that are out of stock or to report products that have reached expiry date or are damaged?**
- 2. How often do you communicate with the store manager, the dairy company and the delivery party concerning the availability of products in the store?**
- 3. Do you consider that your lines of communication are adequate?**

Responsiveness

- 4. In the event that a customer wants something that is out of stock and you ask for it to be delivered to the store, how long does that process generally take?**
- 5. Do you feel that they should be taking less time or is this adequate?**
- 6. If you receive products that are not fit to be sold to customers and are turned back, what is the turnaround time for the dairy company and delivery party to remove the damaged goods and replace with appropriate goods?**
- 7. Do you think that the delivery services of the company you work for are sufficiently responsive?**

Customer service

- 8. Do you ever encounter customers who want a certain product that is not on the shelves? If so, what is the response when you report this?**
- 9. If you have a positive response to your report, what steps are taken by the respondent to ensure that the customer (or subsequent customers) receives the product in question?**

Efficiency

- 10. How often do you receive deliveries from the company you work for?**
- 11. Further to question 9, and considering the demand and the perishable nature of dairy products, is that interval appropriate?**
- 12. How often do you receive defective products and how acceptable do you consider this incidence to be?**
- 13. Do you consider your customers to be cost sensitive i.e. are they loyal to the brand or are they likely to buy whatever product is on sale?**
- 14. If the products, once in-store, are not in good condition, what do you do?**
- 15. What is it that you wish the company that you work for could do better in terms of better catering to customers' needs?**

APPENDIX E: INFORMED CONSENT FORM

UNIVERSITY OF KWAZULU-NATAL
School of Management, IT and Governance

Dear Respondent,

M Com Research Project

Researcher: Theorene Sinegugu Mbili (+27730801930)

Supervisor: Hans Salisbury (033 260 5458)

Research Office: Mariette Snyman 031 260 8350

I, Theorene Sinegugu Mbili am a Master of Commerce student in the School of Management, IT and Governance, at the University of KwaZulu-Natal. You are invited to participate in a research project entitled, “*The demand for agile/leagile third party logistics services: an assessment of dairy industry needs.*”

The aim of this study is to investigate if the logistics services of the dairy companies and their third party logistics providers are efficient and flexible enough to provide for customers’ needs in the dairy industry.

Through your participation I hope to understand if the dairy customers have any special needs that are not catered for by the dairy companies in terms of responsiveness, flexibility and efficiency when dealing with customers’ unexpected needs. The results of this survey are intended to assist the researcher and hopefully the organisations in the dairy supply chain to identify if a logistics gap exists between what the dairy industry is providing and what its customer’s desire. Should any gaps exist, this study will assist companies to determine how best to bridge the gaps.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this research project. Confidentiality and anonymity of records identifying your company or you as a participant will be maintained by the School of Management IT and Governance, UKZN.

If you have any questions or concerns about participating in this study, please contact me or my supervisor at the numbers listed above.

It should take you about 30 minutes/s to complete the interview process.

Sincerely

Investigator's signature _____

Date _____

This page is to be retained by participant

UNIVERSITY OF KWAZULU-NATAL
School of Management, IT and Governance

M Com Research Project

Researcher: Theorene Sinegugu Mbili (+27730801930)

Supervisor: Hans Salisbury (033 260 5458)

Research Office: Mariette Snyman 031 260 8350

CONSENT

I _____ (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

I consent / do not consent to having this interview audio- recorded.

Signature of Participant

Date

APPENDIX F: ETHICAL CLEARANCE APPROVAL LETTER



14 May 2015

Ms Theorene Sinegugu Mbili (208510304)
School of Management, IT & Governance
Pietermaritzburg Campus

Dear Ms Mbili,

Protocol reference number: HSS/0440/015M

Project title: The demand for agile / leagile third party logistics services: An assessment of dairy industry needs

Full Approval – Expedited Application

With regards to your application received on 07 May 2015. The documents submitted have been accepted by the Humanities & Social Sciences Research Ethics Committee and **FULL APPROVAL** for the protocol has been granted.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Dr Sheelika Singh (Chair)

/ms

Cc Supervisor: Dr RH Salisbury
Cc Academic Leader Research: Professor Brian McArthur
Cc School Administrator: Ms Debbie Cunyngame

Humanities & Social Sciences Research Ethics Committee

Dr Sheelika Singh (Chair)

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