
CHAPTER 3
LITERATURE SURVEY:
PRODUCT MANAGEMENT AND THE PRODUCT LIFE CYCLE
CONCEPT

“While many products do not follow this prescribed route because of failure, the product life cycle concept is extremely valuable in helping management to look into the future and better anticipate what changes to make to their strategic marketing programs” (Walker, Boyd and Larréché, 1999: 146).

3.1 INTRODUCTION

This chapter will describe product development and the product life cycle concept as a marketing instrument to be used by marketing decision-makers and marketing strategists as discussed in chapter two. Ansoff's growth strategies will be employed to describe the different growth strategies to be used by a marketing manager, after commercialisation, for market development purposes by means of the product life cycle phases.

Special emphasis will be given to the characteristics, marketing objectives and various strategies to be employed during the different product life cycle phases that will be used in the empirical part of this study.

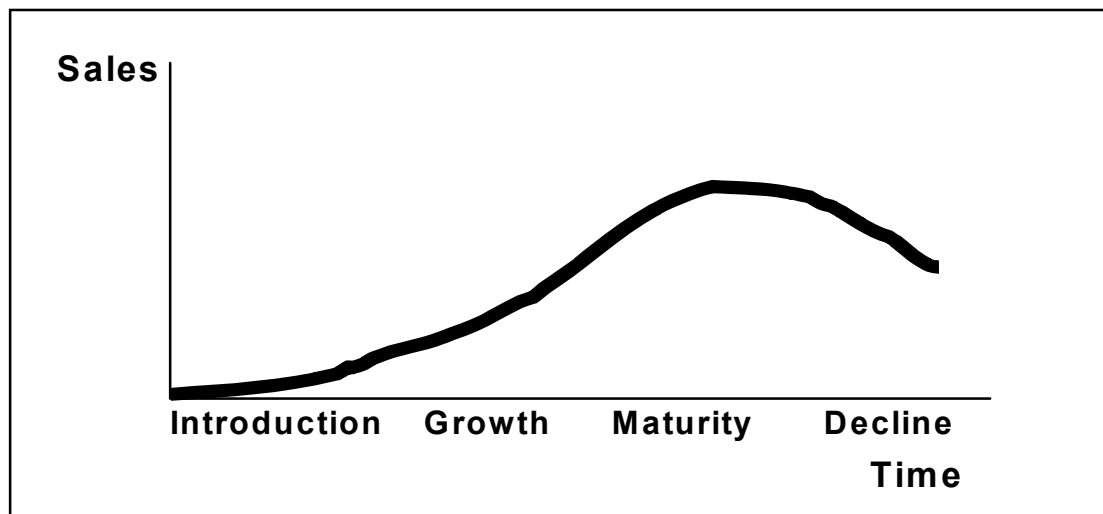
3.2 THE FUNDAMENTALS OF THE PRODUCT LIFE CYCLE CONCEPT

The product life cycle concept has represented a central element of marketing theory since its development in the 1950s. Following its development and its subsequent popularisation in the 1960s, it has remained a stable feature of marketing teaching. The product life cycle concept is one of the most quoted and most frequently taught elements of marketing theory. According to Mercer (1993: 269) the influence of the product life cycle can be seen in other theories, from new product development to portfolio analysis.

Since its adoption by marketing, the product life cycle (PLC) has achieved universal acceptance because of its appeal and wide application. The PLC concept was extensively tested in the fast-moving consumer goods sector, as a predictive tool to anticipate marketing requirements (Grantham, 1997: 4). The product life cycle represents a core element of marketing theory and according to marketing literature, every product or service has, by definition, a life cycle and how this is managed is the key to survival in business.

According to Weber (1976:12) the product life cycle concept provides an intuitively appealing and readily understandable framework of analysis for considering future growth opportunities and pitfalls. As time passes sales increase slowly at first (introduction phase), then more quickly (growth phase), then once again more slowly (maturity and saturation phases), and finally decrease (decline phase). See the different phases of the traditional product life cycle in Figure 3.1.

Figure 3.1: Traditional product life cycle concept



Adapted from: Weber (1976: 120)

The product life cycle concept theory has been subjected to relatively little public criticism, with only 20% of 271 papers published on the subject between 1971 and 1991 undertaking further research into the subject and only a handful challenging its basic assumptions (Mercer, 1993: 269). The researcher will provide a summary table (paragraph 3.10) later on in this

chapter to show product life cycle concept research studies conducted after 1991.

Despite the praise for the product life cycle concept very few publications contested the assumptions it makes (Grantham: 1997: 4). The substantiation of the concept has seemed surprisingly difficult to uncover. Despite all the criticism mentioned in the introductory chapter, the product life cycle concept has become accepted and valued as an element of basic marketing theory and has become a building block for management theory.

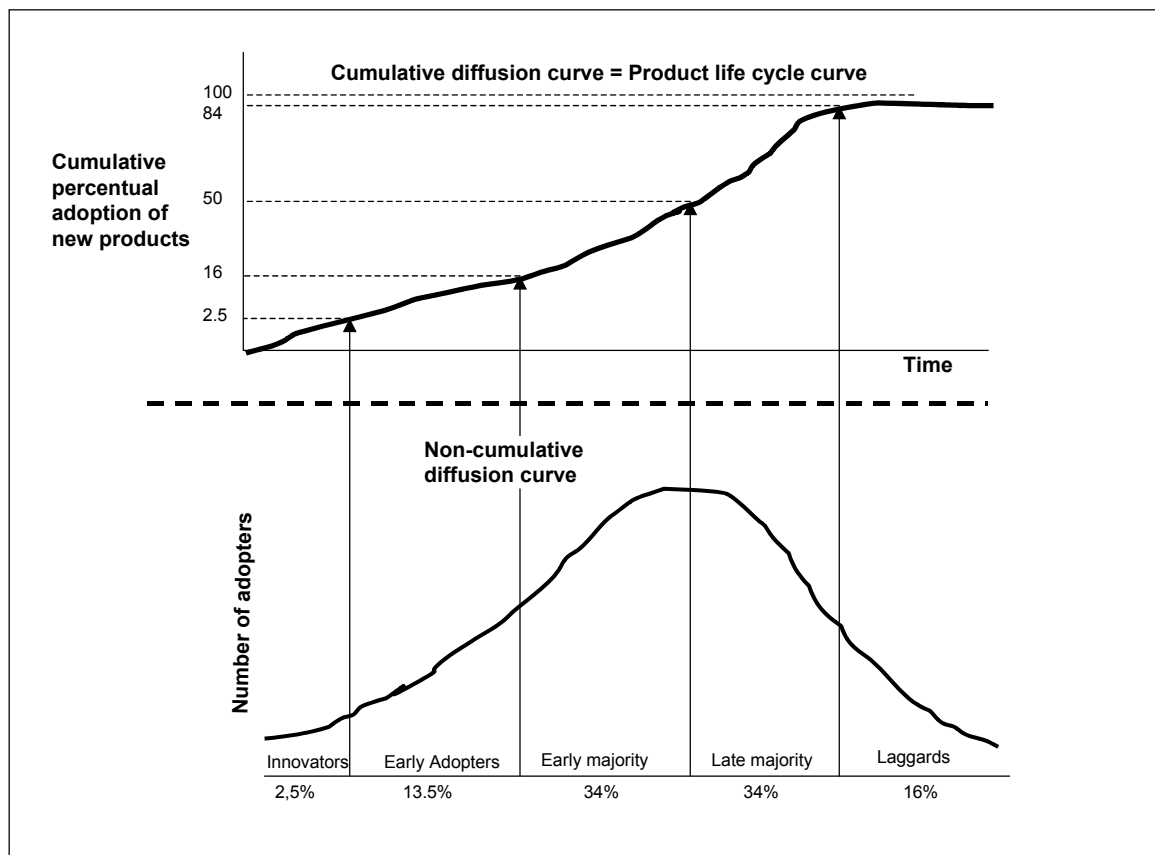
The product life cycle concept has mainly been applied to **large** corporations, businesses and organisations in empirical studies as derived from the literature study. This phenomenon therefore provides a gap and the definite need to test the applicability of the product life cycle concept in small organisations which will be the cornerstone of the empirical research and will be discussed in chapter 6.

3.2.1 Diffusion of innovation and the product life cycle concept

The shape of the traditional product life cycle curve as depicted in Figure 3.1 is the direct result of the diffusion of innovation process.

Diffusion of innovation as depicted in Figure 3.2 starts where the organisation's innovation process ends. The diffusion of innovation deals with the following closely related aspects – the diffusion process, the acceptance process, the profile of innovators and the relationship between the diffusion and acceptance process and the product life cycles. The cumulative diffusion curve as depicted in Figure 3.2 is the result of all the individual sales of a product over time, while the non-cumulative diffusion curve illustrates the adoption rate by consumers over the life cycle of a product (Van der Walt et al, 1996: 213).

Figure 3.2: The relationship between the cumulative and non – cumulative diffusion of innovation and the product life cycle curve



Adapted from: Howard (1997: 198)

As illustrated in Figure 3.2 the product life cycle curve is directly derived from the non-cumulative diffusion curve and it represents the adoption of the product over time by the various adopter categories. The non-cumulative curve can thus be regarded as the product life cycle curve as it indicates the amount of sales over time along with the decline.

As indicated in general marketing literature, no author labels the vertical axis of the traditional product life cycle curve depicted in Figure 3.1 as cumulative or non-cumulative (Kotler & Armstrong, 1989; Van der Walt et al, 1996; Kotler, et al, 1996; Kotler, 1997; Churchill & Peter, 1998; Walker et al, 1999; Perreault & McCarthy, 1999; Lamb et al, 2000 and Kotler, 2000). For the purposes of this study the researcher will label the vertical axis as non-

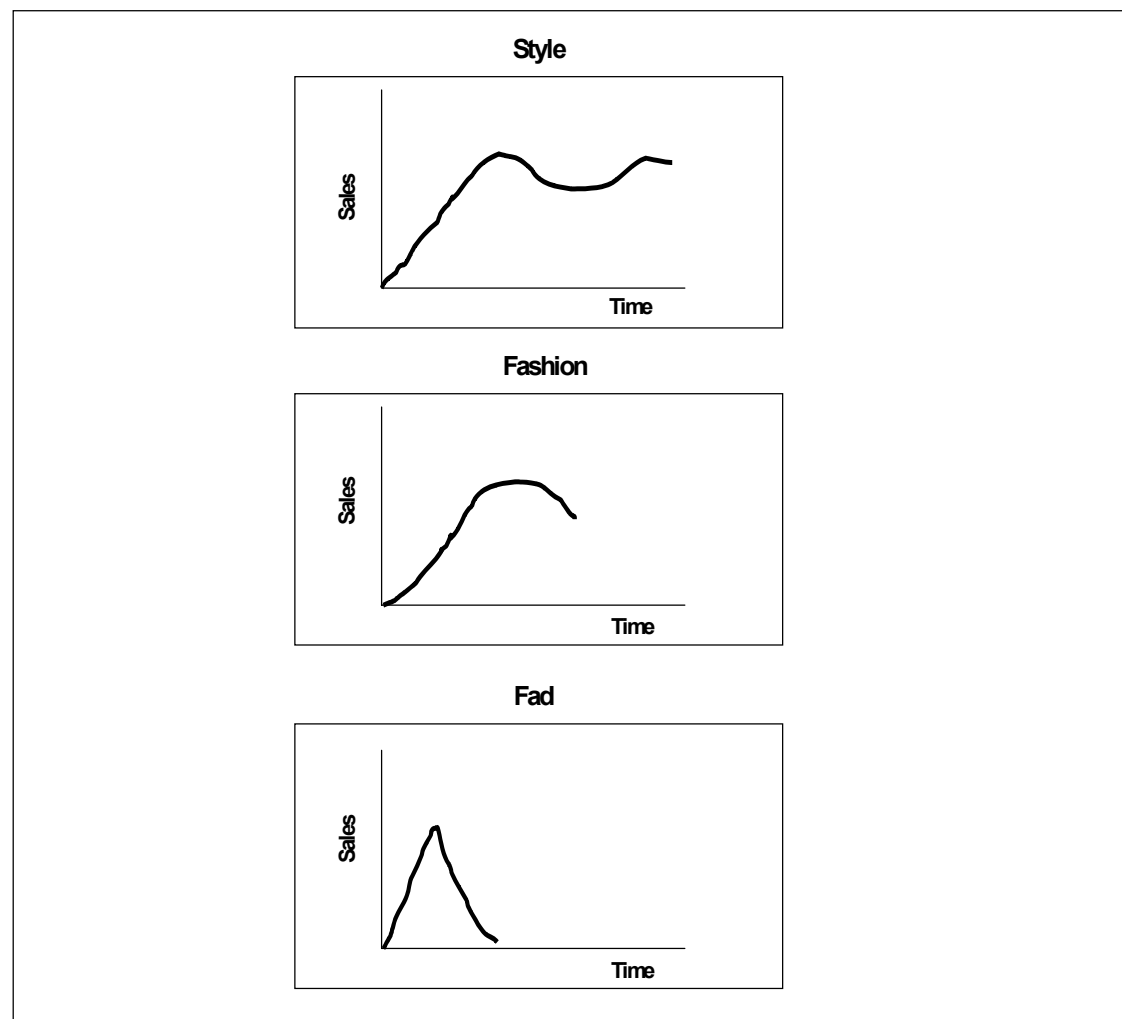
cumulative sales based on the declining nature of the product life cycle curve in the decline phase.

3.2.2 Different product life cycle patterns

The aim of the empirical part of this study is not to test or question the product life cycle curve, but it is necessary to provide a short discussion on the various product life cycle patterns to illustrate the differentiation from the traditional curve illustrated in Figure 3.1.

Product life cycles differ widely with regard to the period as well as the course of the curve. Kotler (1997: 347) distinguishes among three special categories of product life cycle shapes as depicted in Figure 3.3.

Figure 3.3: Style, fashion and fad life cycles



Adapted from: Kotler (1997: 349)

- **A style life cycle**

A style is a basic and distinctive mode of expression appearing in a field of human endeavour. For example, styles appear in homes, clothing and art. Once a style is invented, it can last for generations, going in and out of vogue.

- **A life cycle for fashions**

A fashion is a currently accepted or popular style in a given field. For example, jeans is a fashion in today's clothing, and rap is a fashion in today's popular music.

The fashion life cycle has some important managerial applications. According to Sproles (1981: 122) the fashion life cycle concept is widely applied by manufacturers and dealers but often at an intuitive rather than scientific level. For instance, in any new fashion season, a producer may propose hundreds of designs ranging from classics to established fashions (basic merchandise) to very innovative designs and a few exotic items. Similarly, dealers develop assortment policies stating a certain percentage of merchandise in each fashion classification. For manufacturers and dealers who are involved in such assortment decisions, a systematic knowledge of the correct life cycle position of each style is crucial.

- **A fad life cycle**

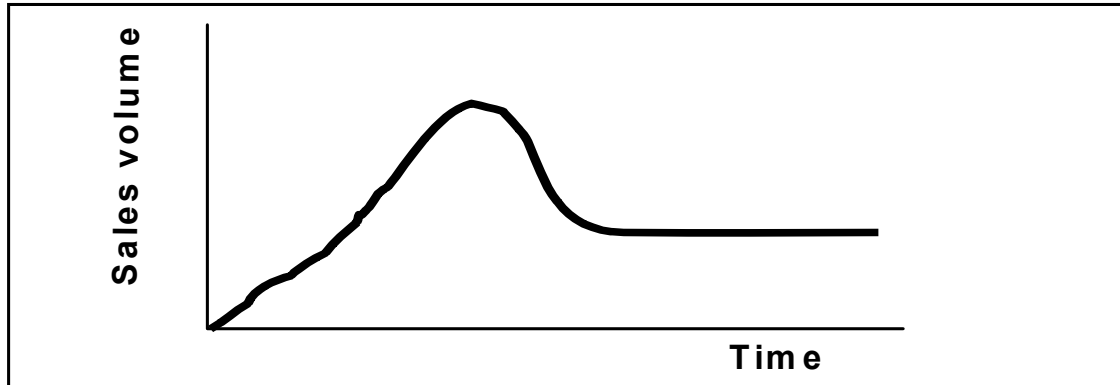
Fads are fashions that attract public attention and awareness, are adopted with great speed, peak early and decline very fast. Their acceptance cycle is short, and they tend to attract only a limited following. They often have a novel or capricious aspect, such as body piercing and body tattooing.

Not all products show the S-shape as illustrated in Figure 3.1 and bell-shape as illustrated in Figure 3.2. Researchers have identified a number of alternate patterns – the growth-slumped maturity pattern, the cycle-recycle pattern and the scalloped pattern are discussed and illustrated in Figure 3.4, Figure 3.5 and Figure 3.6 below.

- **Growth-slumped maturity pattern**

The growth-slumped maturity pattern is illustrated in Figure 3.4 below.

Figure 3.4: Growth – slumped maturity pattern



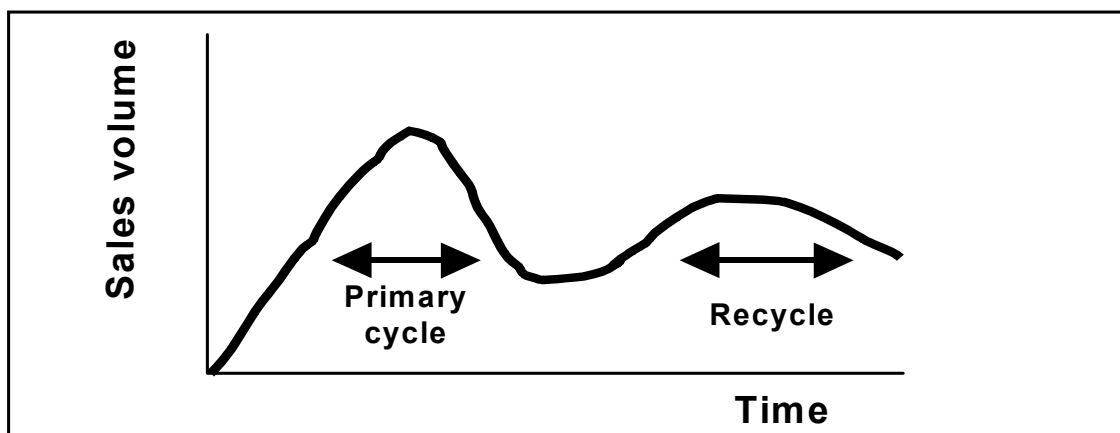
Adapted from: Kotler (1997: 347)

The shape of the product life cycle curve illustrated in Figure 3.4 above is often a characteristic of small kitchen appliances. As depicted in Figure 3.4 late adopters buy the product for the first time and early adopters replacing the product to sustain the petrified level.

- **Cycle-recycle pattern**

The shape of the product life cycle curve illustrated in Figure 3.5 is often related to the sales of pharmaceutical products.

Figure 3.5: Cycle – recycle pattern



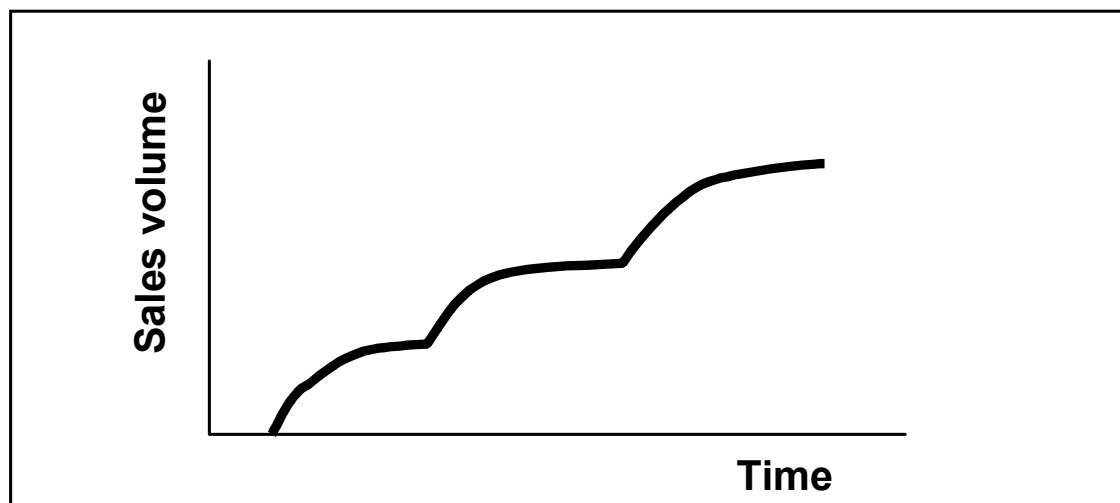
Adapted from: Kotler (1997: 347)

An example of this pattern in Figure 3.5 can be when pharmaceutical companies aggressively promote a new drug and this results in the first cycle (primary cycle). Later, sales start declining and the company gives the drug another promotion push, which produces a second cycle (recycle) that is usually of smaller magnitude and shorter duration.

- **Scalloped pattern**

The scalloped pattern is illustrated in Figure 3.6.

Figure 3.6: Scalloped pattern



Adapted from: Kotler: (1997: 347)

As illustrated in Figure 3.6 sales pass through a succession of life cycles based on the discovery of new-product characteristics, uses or users. Nylon's sales, for example, showed a scalloped pattern because of the many uses discovered over time.

3.2.3 Levels of aggregation for the product life cycle

An important issue that the marketer should consider is to clearly delineate the level of aggregation that is applicable to the life cycle. The level of aggregation is critical for the understanding of the strategic needs of the organisation. To analyse for instance a product category (liquor), a product form (white liquor), a product (vodka) or a brand (Smirnoff), marketers mainly use the product life cycle concept.

Many levels of aggregation exist and it can be similar or different from the traditional curve as depicted in Figure 3.1 and the bell shaped curve as illustrated in Figure 3.2.

The levels of aggregation are ranging from the international level to the brand level:

- **International product life cycle** – this has been used to describe international trade patterns and to explain international trade fluctuations.
- **Corporate life cycle** – this applies to the life cycle of the total organisation (the level of aggregation is the whole organisation).
- **Brand product life cycle** – this will be the sales history of the brand. The brand is unique, for example Castle.
- **Brand form or type life cycle** – the brands that satisfy a definite set of needs and are made up by the joint sales histories of all the brands that constitute the product form. For example, all the filter cigarette brands.
- **Product class life cycle** – this contains all the different forms that a class can have and would represent the combined sales of all the different product forms constituting the product class. For example, a filter cigarette is a product form, while all types of cigarettes would reflect the product class.

According to Du Plessis, Jooste and Strydom (2001: 221) the brand life cycle, the product form life cycle and the product class life cycle are the three life cycles most prominent to marketers.

Academics agree that there is no comparable and satisfactory empirical validation of the “classic” product life cycle concept. According to Wood (1990: 148) the product form bears the closest approximation to the PLC. A too high aggregation (product class) often results in a stable mature phase of the product life cycle, while a too low aggregation (product brand) often indicates the history of the specific brand and not the product form.

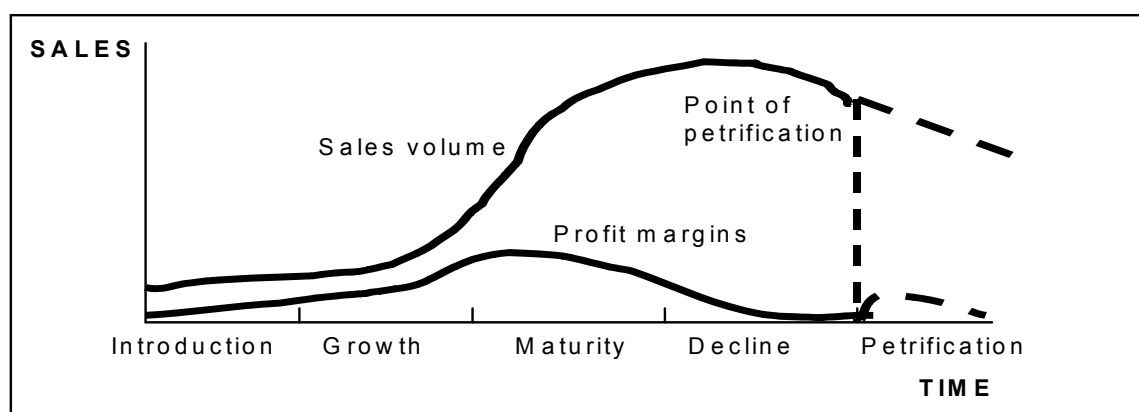
3.2.4 Product life cycle extensions

The exact phases of the product life cycle are not easily demarcated as different products may behave and respond differently. Some products skip certain phases while others linger in one phase but move rapidly through another. It is therefore essential to provide evidence from theory in order to present arguments describing phases beyond the traditional four phases of the product life cycle concept as described by Kotler (1997: 363) and illustrated in the introductory chapter.

- **Product petrification**

According to Michael (1971: 88) the lack of preciseness of the decline phase in the traditional viewpoint of the life cycle theory, as witnessed by sales and profit curves stopping curiously in mid-air as illustrated in Figure 3.7, is partly due to the fact that new products receive more attention than older products. Developing, launching and managing a new product or product line can be very exciting. It is surmised that the attention span decreases especially when products are becoming weaker. Most products with declining sales are usually in the final phase of their life cycle. According to Michael (1971: 88 - 91) there is considerable evidence available that the decline may consist of two different phases. The already recognised phase of declining sales is labelled by Michael (1971: 89) as that of product petrification and is illustrated in Figure 3.7 below.

Figure 3.7: Product petrification: A new phase in product life cycle theory



Adapted from: Michael (1971: 89)

Figure 3.7 indicates that sales are declining rapidly and the corresponding profit margins are close to zero. By adding the product petrification phase the sales and profit curves do not stop abruptly, it hardens and prolongs the decline phase.

Product petrification is related to individual products and product lines. Often products or product lines are discontinued before the opportunity for petrification is recognised. Petrification is an extension of the decline phase of the product life cycle and it offers profitable opportunities. Products that can be lead profitably through a petrification phase can be found in many product lines such as stainless steel and chromium razor blades (Michael, 1971: 88). Products displaying a decrease in sales exhibit different characteristics, some of which hint at petrification potential.

Such products almost always become less available at the consumer level, either because dealers refuse to carry slow movers or else the producer finds it more profitable to concentrate distribution on newer products. In both instances, the limited availability (or partial withdrawing) of a declining product with product petrification potential exhibits the following characteristics:

- Consumers continue to seek the product through the regular channel.
- Letters to the producer regarding the product's lack of availability increase.
- Competing or substitute items in the product line enjoy unexplained sales boosts.

Two USA companies manufacturing and marketing steel razor blades and toothpaste have produced improvements in the profitability of declining products by taking advantage of the product petrification phase of the life cycle. Instead of withdrawing the steel razor blade because it is a declining sales product, the industry raised prices 15 to 20 percent while cutting promotion to zero (Michael, 1971: 90).

The successful implementation of product petrification requires a marketing strategy uncommon to those generally recommended for the traditional

phases of a product's life cycle. The elimination of marketing promotion is possible because the rate of decline of sales is not escalating. The inelastic price relationship with volume associated with a considerable number of products with petrification potential allows profit margins to inflate.

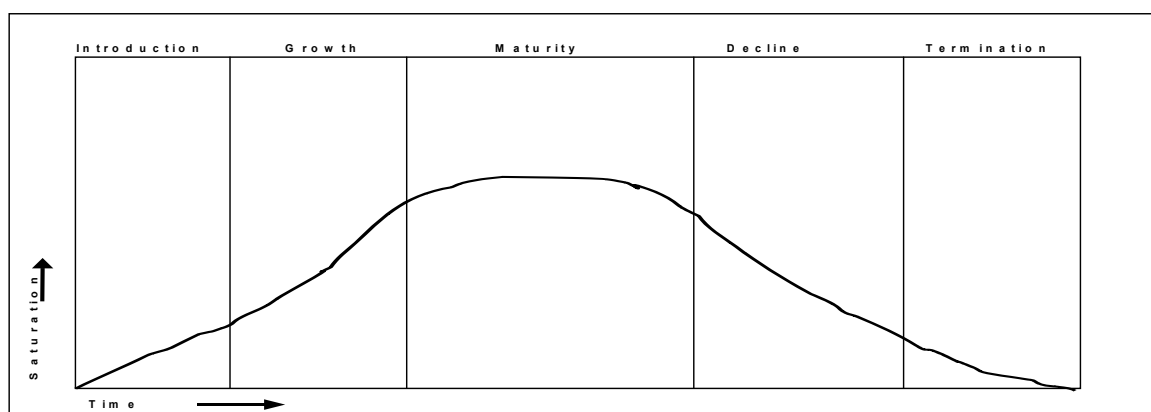
The researcher is of the view that the petrification phase as described by Michael (1971: 88–90) should be part of the strategy employed during the decline phase with the objective of avoiding the quick withdrawal of products from the market. It can not be a separate phase and the traditional four phases of the product life cycle concept as described by Kotler (1997: 363) and illustrated in the introductory chapter is still valid.

- **The PLC and saturation**

The traditional product life cycle is the result of sales accumulated over a certain time period as illustrated in Figure 3.2.

Figure 3.8 is the result of an empirical study undertaken by Smallwood (1973: 29-35) on US household appliances such as dishwashers, colour televisions, freezers, refrigerators and ovens. Smallwood (1973: 29-35) identified the product life cycle as seen in Figure 3.8 as a valuable tool for management in forecasting, pricing, advertising and distribution. According to Smallwood (1973: 29) the vertical scale is measured in saturation of the product, while the horizontal scale is calibrated to represent the passage of time.

Figure 3.8: Life cycle phases of various products



Adapted from: Smallwood (1973: 29)

The vertical axis represents the percentage of customers using the product, while the horizontal axis is calibrated to represent the passage of time. Smallwood (1973: 30) provides labels for the vertical axis as saturation in contradiction with the traditional product life cycle concept that labels the vertical axis as sales. This labelling of the vertical axis by Smallwood (1973:30) is similar to the labelling of the number of adopters using a product over time in the non-cumulative diffusion curve as depicted in Figure 3.2.

There is no relation between the termination phase depicted in Figure 3.8 and the petrification phase depicted in Figure 3.7. The termination phase prescribed by Smallwood (1973: 29) posits the termination of the product from the market at a fast rate while the petrification phase prescribed by Michael (1971: 89) posits a slower decline in sales prolonging the life of the product on the market.

Apart from the petrification and saturation phases described above Walker et al (1999: 147) posit a shakeout or competitive turbulence phase after growth and just before the maturity phase. This phase is characterised by a decreasing growth rate that results in strong price competition, forcing many organisations to leave the industry or to sell out.

3.2.5 Application areas of the product life cycle concept

In order for the product life cycle concept to have any practical use, the marketing manager needs to know the answers to the following three questions (Wood, 1990: 150):

- Given a proposed new product or service, how and to what extent can the shape and duration of each phase be predicted?
- Given an existing product, how can one determine in what phase it is?
- Given all this knowledge, how can the product life cycle concept be used effectively?

The product life cycle concept can be applied to many marketing sub disciplines, ranging from product development, growth management and

strategy. Table 3.1 provides a summary of the different application areas of the product life cycle concept as derived from various publications since 1981.

Table 3.1: Application areas of the product life cycle concept

Author(s)	Application area	Large / small organisations
Harrel and Taylor (1981: 68 - 75)	Electrical houseware products	Large
Qualls, Ohlhavsky and Michaels (1981: 76 - 80)	Household appliances	Large
Tigert and Farivar(1981: 81 - 90)	High technology products	Large
Ayal (1981: 91 – 96)	International trade	Large
Thorelli & Burnett (1981: 97 – 108)	Industrial products	Large
Sproles (1981: 116 - 124)	Fashion products	Large
Payburn and Curley (1984: 305 - 311)	Information technology	Large
De Bresson and Lampel (1985: 170 - 189)	Technological design	Large
Cravens (1986: 76-80)	Tyre industry	Large
Lambkin and Day (1989: 4 – 21)	Industrial products	Large
Brown (1992: 41 – 52)	Industrial products	Large
Paley (1994: 51 – 52)	Computer software	Small
Ryan and Riggs (1996: 33 – 41)	Industrial products	Large
Grantham (1998: 8)	Technological products	Small
Agarwal (1997: 571 – 585)	Manufactured products	Large
Shankar, Carpenter & Krishnamaruthi (1999: 269 - 277)	Pharmaceutical products	Large
Magnan, Fawcett and Birou (1999: 239 – 253)	Manufactured products	Large

It is clear from Table 3.1 that the various attempts at applying the product life cycle concept in practice is mainly restricted to fashion retailing, fast moving consumer goods, technological products, manufactured goods and industrial products.

The following conclusions were made from the studies depicted in Table 3.1:

- The product life cycle is a valid tool for predicting the sales volume of a product class (Harrel & Taylor, 1981: 75).
- Managers must begin to pay more attention to the timing of their entry into the market (Qualls et al, 1981: 80).
- The product life cycle concept forces a disciplined approach to estimating market potential (Tigert & Farivar, 1981: 90).

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- A systematic knowledge of the correct life cycle position is crucial in order to make the correct decision for the future (Sproles, 1981: 122).
 - By making sense of the information the various product life cycle concepts can make managers more liable to consider certain options or to dismiss others (De Bresson & Lampel, 1985: 189).
 - A need was identified for modelling the dynamics of competitive behaviour in evolving market structures as organisations do have the choice to act early or to wait and spread their resources to lower their risk (Lambkin & Day 1989: 8-9).
 - To be more innovative and to manage the crucial strategic importance of innovation managers need to (Brown, 1992: 50–51):
 - (a) Lower the expectations of large sales of innovative new products since such products are likely to appeal initially to only a small number of innovative customers.
 - (b) Target innovative products at the segment that needs it the most, and the innovators and early adopters within the segment, rather than the mass market.
 - (c) Build positive attitudes to change underpinning the flexibility to manage discontinuities, which is essential to effective innovations.
 - (d) Provide rewards to product line managers to encourage them and to reduce career implications and failure.
 - By increasing skill, marketing and sales managers will begin to execute product life cycle strategies to achieve the following objectives (Paley, 1994: 51):
 - (a) Extend the sales life of their products.
 - (b) Find a viable market position to avoid head-on confrontations with strong competitors.
 - (c) Deploy their sales forces for greater productivity.
 - The product life cycle is a tool that can be deployed to accelerate effective decision-making in markets demanding ever-increasing levels of speed and agility (Ryan & Riggs, 1996: 39).
 - The probability of survival in the marketplace differs across the product life cycle phases. A consistent decline in survival rates is seen when the
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intensity of competition increases. Early entrants enjoy a higher probability of survival across all product life cycle phases than later entrants (Agarwal, 1997: 580).

- After accounting for entering a market, the stage of the product life cycle in which a product enters has a significant effect on growth, market response and sales (Shankar et al, 1999: 269-277).

Table 3.1 further indicates that the majority of the product life cycle studies were conducted in large organisations in the USA and UK. Grantham (1998: 8) provides the only proof from literature on the successful application of the product life cycle concept within a small organisation named Quarterdeck Office Systems. The reason for this success story will be discussed in paragraph 3.16.

Two valuable contributions not depicted in Table 3.1 because they are not related to marketing directly, were made by Birou, Fawcett and Magnan (1998: 37-48) and Rink, Roden & Fox (1999: 65). They empirically tested the product life cycle concept for functional strategic alignment and financial planning purposes respectively.

- Birou et al (1998: 37-48) concluded that by exploring the potential of the product life cycle to act as a strategic planning framework it is clear that there is no quick and tested formula for the application on the product life cycle in practice.
- The product life cycle – financial model developed by Rink et al (1999: 65) provides guidelines for financial decisions to be taken during the different products' sales cycle. The model furthermore clarifies finance's relationship with the other functions in the organisation in the decision-making process. This is an indication that the product life cycle concept can be applied to assist and help integrating thinking by all functions during the product life cycle phases.

Despite the various efforts highlighted in Table 3.1 there are many criticisms, unsolved problems and difficulties in the practical application of the product life cycle concept as a marketing decision-making tool.

3.2.6 Criticism, gaps and the validity of the product life cycle concept

(a) Criticism of the product life cycle concept

Some serious criticisms as discussed in the introductory chapter, have been made about/against the product life cycle concept. Table 3.2 provides a summary of the major criticisms and problems linked to the PLC concept.

Table 3.2: Major criticisms of and problems with the PLC concept

Major criticisms and problems	Author(s)
The PLC concept has no practical use	Levitt (1963: 93)
It is still difficult to determine at which phase of the PLC a product or service is	Levitt (1963: 93) Dhalla and Yuspeh (1976: 102 - 110) Grantham (1997: 9)
The PLC concept has not yet been tested systematically	Polli and Cook (1969: 385 - 400)
The PLC led many companies to make costly mistakes and to neglect opportunities. It is often difficult to accurately determine in which phase of the PLC a product actually is. Shortcomings on the practical application of the PLC concept	Dhalla and Yuspeh (1976: 102 - 110)
There is still no evidence of the efficacy of the PLC as a tool to predict marketing strategy.	Dhalla and Yuspeh (1976: 102 - 110) Grantham (1997: 9)
Most empirical studies testing the product life cycle concept have found that it lacks validity or usefulness for explaining sales growth	Weber (1976: 19 - 290)
The problem with the PLC concept is that sales are modelled primarily as a function of time and are expected to produce curves that display growth, levelling and decline	Tellis and Crawford (1981: 125 - 132)
In many markets the product or brand life cycle is longer than the actual planning life cycle of organisations	Mercer (1993: 269 - 274)
There is still serious doubt about the application of the product life cycle as a marketing tool	Grantham (1997: 4)

It is clear from the information provided in Table 3.2 that there are some overlapping criticisms:

- Levitt (1963: 93), Dhalla and Yuspeh (1976: 105) and Grantham (1997: 4) are sharing the view that it is often difficult to determine in which phase of the product life cycle a product or service is. It is clear that one of the earliest and most concerning aspects of the application of the product life cycle concept is still eminent today.
- Weber (1976: 12) and Grantham (1997: 4) are questioning the product life cycle concept's lack of validity in terms of the ability to identify in which phase the product is.

The transition from one phase to another is therefore not clear and the transition from birth to growth, maturity and death is far from inevitable. By implanting an expectation of decline in the minds of marketing managers, the product life cycle concept itself may become a self-fulfilling prophecy with intrinsically valuable brand equity prematurely axed from portfolios (Wood, 1990: 151).

In addition to Table 3.2, Day (1981: 65) strengthens the existing but common theme of criticism, doubt and the need for further investigation into the PLC concept on strategic and functional levels. He points out that the identification of the boundaries between phases will be effected by the variety of product life cycle patterns. The more variations of the PLC identified, the more difficult the positioning process becomes.

(b) Gaps in the product life cycle concept

The gaps in the product life cycle concept are derived from the various criticisms and problems associated with its practical application. Many gaps have been identified that link very closely with the criticism raised during the previous four decades and depicted in Table 3.2. of which the major ones are:

- On-going scepticism over the product life cycle theory's applicability (Dhalla and Yuspeh, 1976: 105).

- A lack of validity or usefulness of the product life cycle for explaining sales growth (Weber, 1976: 12).
- There is a definite need for the development of a more sophisticated theory of the PLC in order to know more about the shape of the PLC curve (Midgely, 1981: 114).
- The clear value of life cycle analysis is still to be proven (Sproles, 1981: 123).
- The application of the product life cycle theory for strategic planning across functional areas has been overlooked (Birou, Fawcett and Magnan, 1998, 38).
- The product life cycle itself is insufficiently uniform to provide a basis for decision-making and therefore for planning Doyle (1976: 3).
- The product life cycle is empty of empirical generality and positively dangerous if used as a guide for action (Grantham, 1997: 7).

The gap identified by Grantham (1997: 7) will be tested among marketing decision-makers in small organisations in Gauteng, South-Africa who are applying the product life cycle concept in strategy and marketing strategy formulation. It is clear from the literature study that:

- No empirical research on the applicability of the product life cycle for decision-making in small organisations has been undertaken to date.
- The study on the applicability of the product life cycle concept concentrated mainly on large organisations as indicated in Table 3.1.
- The studies done to date on the applicability of the product life cycle concept was executed abroad – not in South Africa.

These gaps provide substance for the decision of the researcher to conduct empirical research on the applicability of the product life cycle concept among small organisations in South Africa.

(c) The validity of the product life cycle concept

The development of accurate life cycles cannot be accomplished overnight, but on the other hand accurate life cycle patterns can be generated within a

single operation period. Weber (1976: 22) concluded in his study that despite the general acceptance of the product life cycle concept among academics and practitioners, most studies testing the product life cycle concept have found that it lacks validity as to indicating which “life” is investigated and as to the complications of the empirical research.

Despite the demonstrable lack of general applicability for the product life cycle theory as a whole, the major lesson of the PLC – that change is to be ignored at the marketing manager’s peril – still holds true (Mercer: 1993: 274). More recently Grantham (1997:9) made the following conclusions sharing this feeling and concluded that:

- there is serious doubt about the validity of the product life cycle as a marketing tool;
- the value of the product life cycle for forecasting purposes is limited; and
- there is still doubt and no evidence of the efficacy of the product life cycle as a tool to predict marketing strategies.

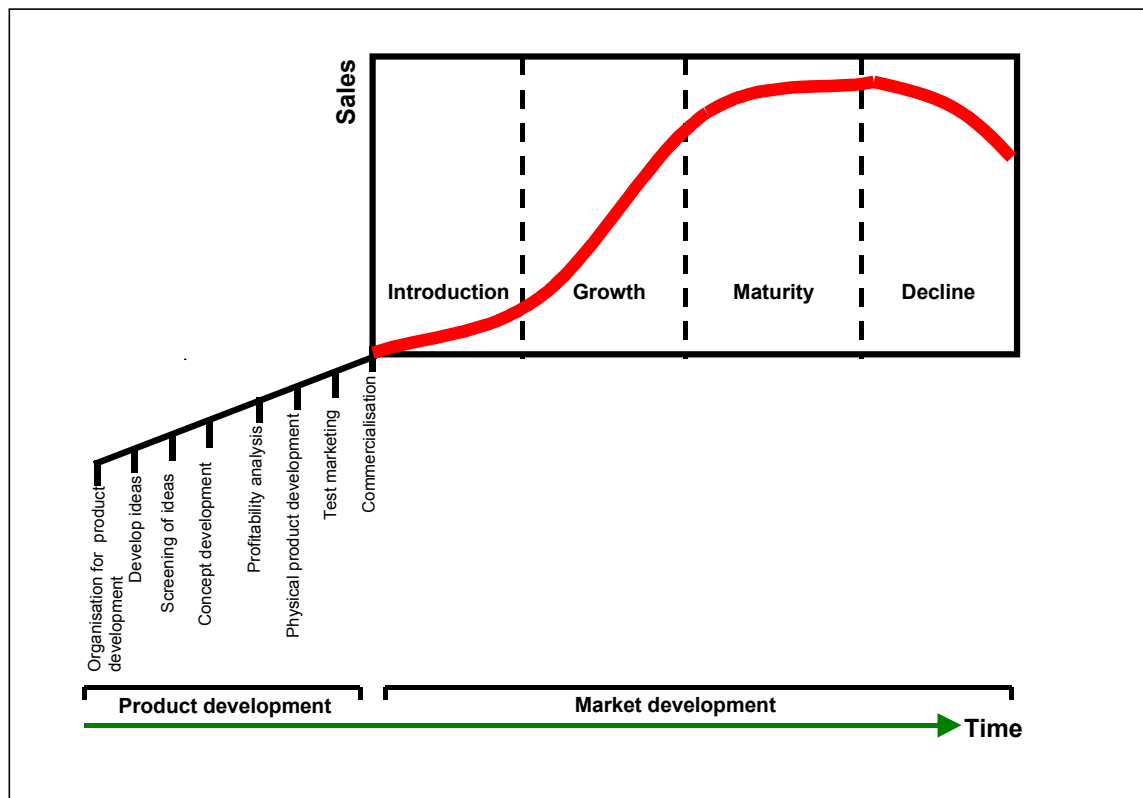
This thesis will however, through the various research propositions as discussed in chapter six, endeavour to test the applicability of the product life cycle concept among small organisations in Gauteng, RSA.

3.3 PRODUCT MANAGEMENT

The marketing mix variables discussed in chapter two is a valuable tool available to the marketer of a physical product in order to manage the product through the various phases of the product life cycle. Marketing related decisions could be made by applying different strategies such as branding, product line extensions, product modifications, positioning and growth strategies. The growth of existing products can be achieved through market penetration and market development as discussed in chapter two.

The management process of a product or service (offering) starts with the new product development and continues along the different product life cycle phases as part of market development as depicted in Figure 3.9.

Figure 3.9: Sequence and steps associated with the development process of a product



Adapted from: Lamb, Hair, McDaniel, Boshoff and Terblanché (2000: 340) and Kotler (1997: 363)

Figure 3.9 will be referred to in the discussions of paragraph 3.3.1 and paragraph 3.3.2.

3.3.1 New product development

New products or services can be defined as those products or product attributes which are new to the organisation and which the target market regards as being significantly different from existing competitive products or services (Van der Walt et al, 1996: 196). New product development is a systematic process that has to be followed in order to create new products or services with the lowest possible sacrifices and risks and with the highest

possible benefits to the organisation. This process should further create the highest possible need satisfaction for the target market (Van der Walt et al, 1996: 199).

New product development is the main theme in the product development process, but new product development can also be related to each phase of the product life cycle as illustrated in Figure 3.9. Different product strategies can be employed in the different product life cycle phases based on the product sales and market conditions, such as changing consumer preferences, technological advances and changing economical conditions.

(a) Steps in product development

The nature of the decision-making process in product development is depicted in Figure 3.9. At each step in the product development process the developer has to decide which ideas to discard and which ideas to retain for the next step. According to Van der Walt et al (1996: 196) the developer is continuously confronted with a go/no or go/don't know decision-making situation. If the decision is go, the idea advances through to the next step; if the decision is no go, the idea is not pursued.

The product development process as depicted in Figure 3.1 is divided into the following eight chronological steps (Lamb et al, 2000: 240-246):

- **Step 1: Organisation for product development**

According to Lamb et al (2000: 245) several types of groups or structures within an organisation can facilitate the development of new products. These groups or structures include new-product committees and departments, venture teams and intrapreneurs.

The establishment of an effective organisation in which product development can be stimulated, planned, co-ordinated and controlled is one of the most important prerequisites for successful product development. New product development should be a combined effort by the different departments or functions in the organisation and this combined effort will be discussed in

paragraph 3.2.1(b). Most leaders of new product teams are aware of the complexity of the problem they are confronted with and the changes that must occur before cross-functional teamwork can accelerate the new product development process (Jassawalla and Sashittal, 2000: 34).

Organisations handle the organisational aspects of new product development in the following ways (Kotler, 2000: 333):

- (i) *Product managers* – many organisations assign the responsibility for new product development ideas to product managers.
- (ii) *New product managers* - many organisations assign the responsibility for new product development to new product managers. Johnson & Johnson have new product managers who report to category managers. Product managers similar to new product managers tend to think in terms of modifications and line extensions limited to their product market (Kotler, 2000: 333).
- (iii) *New product committees* – many organisations have a high-level management committee responsible for reviewing and approving proposals.
- (iv) *New product departments* – large organisations often establish a department headed by a manager who has substantial authority and access to top management. The new product department's major responsibilities include generating and screening of new ideas, working with the R&D department, and conducting test marketing and commercialisation as depicted in Figure 3.1.
- (v) *New product venture teams* – a venture team is a group brought together from various operating departments and charged with developing a specific product, service or business.

- Step 2: Development of ideas

New product ideas can come from a variety of sources, such as customers, employees, distributors, competitors, research and development, and consultants.

- Step 3: Screening of ideas

The screening of product ideas includes a process of eliminating ideas that are inconsistent with the organisation's new-product strategy or are obviously inappropriate for some other reasons. The new-product committee, the new-product department, or some other formally appointed group can perform the screening process. Screening questions such as competitive advantage, resources, legal implications and profitability can be addressed early in the product development process.

- Step 4: Concept development

The viable product ideas from step 3 can be transformed into a product concept and be subjected to a more thorough evaluation. Evaluation questions can include answers to questions on who will use the product? what is the primary benefit of the product? and when will the product be used? According to Lamb et al (2000: 241) the product concept flows from combining unique product attributes to certain customer needs and actions.

- Step 5: Profitability analysis / Business analysis

During this step preliminary but detailed figures for demand, cost, sales and the calculation of profitability are calculated. Answers to questions such as demand, impact on profit, market share and return on investment, customer benefits, competitive response and the impact on organisational resources will provide management with a clear understanding of the product's market potential.

- Step 6: Physical product development

During this step prototypes are developed and the organisation starts compiling a preliminary marketing strategy. The physical development process is optimallised best when all functional areas such as R&D, engineering, production, marketing and even suppliers work together rather than sequentially.

- Step 7: Test marketing

After products and marketing strategies have been developed, they are usually tested in the “real world” – the marketplace. Test marketing is the limited introduction of a product and a marketing strategy to determine the reactions of potential customers in a market situation (Lamb et al, 2000: 243). With the selection of a test market many criteria need to be considered such as marketing variables (product, price, place, promotion, segmentation and positioning), demographics (income, age, gender, purchasing habits), psychographics and possible geographical areas where the product will be marketed.

- Step 8: Commercialisation

As illustrated in Figure 3.9 commercialisation is the last step in product development and the first step in market development, but product development as a strategy can also occur during the market development stage. For instance, product modifications can be used as a new product development strategy in the mature phase and the steps in product development can be used in this process.

(b) Product development and interrelationship with other functions in an organisation

The development and marketing of a product have an affect on the organisation in general and each functional area in particular.

Jassawalla and Sashittal (2000: 46) provide the following description on how product decisions can influence the other functions in an organisation:

- The development and manufacturing of new products present technical challenges for production/operations management.
- Product decisions have a substantial influence on the financial management of an organisation.
- Product decisions directly affect the human resources of an organisation.
- Product decisions influence information management in the organisation.

- The purchasing department in an organisation is affected in a special way by product development and other product decisions.
- The marketing department in the organisation can effectively use information on the product mix that the organisation manufactures and markets.

Interaction, information sharing and cross-fertilisation of ideas among people from R&D, production, marketing and other groups is essential when product development is handled by a multi-functional team. According to Jassawalla and Sashittal (2000: 46) problems arise when people with dissimilar orientations, experiences and interests are called upon to interact, make decisions and participate in a co-creative endeavour such as new product development. A closer examination of the human interaction process that characterises new product development shows that effective leadership as well as followership, equitable distribution of power and a concern for building collaboration among participants can make the human interaction more productive and facilitate the progress of ideas across organisations.

(c) Important issues to ensure the success of the new product development process

Timing, globalisation, participation of management and customer interaction are some of the most important issues related to the process of new product development. There is no empirical proof of a time frame linked to the product development process. The time frame linked to the product development process and business life cycles are measured in months and executives must therefore plan their new product replacements almost at the same time that they launch them (Anonymous, 1997: 42-46). Chrysochoidis and Wong (2000: 268) are of the opinion that international product managers must assign greater priority to assessing the relative advantages of customising new product technology and not to consider the timing implications for both the new product development effort and subsequent rollout.

As global competitive pressure increases and product life cycles are compressed, organisations are trying to shorten the product development cycles (Griffin, 1997: 1-24). This view is shared by Lee, Lee and Sonder (2000: 497) who stated that to ensure success in the current age of globalisation, it is imperative for organisations to understand the management practices of competitors both within and outside national boundaries.

Apart from understanding competition Gruner and Homburg (2000: 1) are of the opinion that more attention should be given to customer interaction in the new product development process as a means to increase new product success.

Top management support is crucial to new product development success and Swink (2000: 208) indicates that top management support is positively associated with better time-based performance, quality design and financial performance as a whole. Gil and de la Fe (1999: 391–404) posit that risk and costs associated with new product development can be shared among the partners and more effective use can be made of manufacturing facilities and production capabilities. This strategy was successfully employed by two international joint ventures – Rover with Honda and Seat with Volkswagen.

3.3.2 Market development

Market development is a collective for managing products during the four phase of the product life cycle and must not be confused with Ansoff's growth strategy of market development.

Various growth strategies based on cross classifying product and product-market extension possibilities have been discussed in chapter two. Ansoff (1957: 113 - 124) described the following growth opportunities to be used for market development purposes after a product have been commercialised:

- (i) Product development.
- (ii) Market development.
- (iii) Market penetration.
- (iv) Diversification.

(a) Product development

New product development was discussed in paragraph 3.3.1(a) and illustrated in Figure 3.9 but a variety of decisions have to be taken continuously during the market development phase on the existing product/service mix and product/service ranges. Through product development organisations can grow by developing new product-line extensions or by means of new product offerings.

New products can also be called innovations. An innovation or innovative product is a product perceived as new by a potential consumer (Lamb et al, 2000: 254). Existing products can be changed by means of product modification or current packaging may be changed. Potential consumers will regard such product as new and different from the existing product.

(b) Market penetration

In relation to Ansoff's growth strategies as depicted in Figure 2.4 a marketer can use market penetration to develop the market with current products. Market penetration in existing markets aims at encouraging current customers to use more of the current product, to use it more often, or to use it in new ways. Market penetration can be employed through mass market penetration or niche penetration.

Mass market penetration and niche penetration will be discussed in the next section.

(i) Mass-market penetration

The ultimate objective of mass-market penetration is to capture and maintain a commanding share of the total market of existing products. Marketing programme components for a mass-market penetration are increasing customers' awareness and willingness to buy, increasing customers' ability to buy and considerations for pioneering global markets – exporting, franchising, contract manufacturing, joint ventures and sole ownership.

The short-term objective of mass-market penetration is to maximise explorers and adopters in the total market and to invest heavily to build future volume and market share. The medium-term objectives are to maintain the pre-emption of competition and to maintain a leading share position even if some sacrifice of margins is necessary in the short term as new competitors enter the market. The long-term objective is to maximise the return on investment (ROI).

According to Walker et al (1999: 232) mass penetration can be achieved through the following two possible strategic objectives:

- To **increase the customers' awareness** by means of heavy advertising, extensive sales force efforts, extensive introductory sales promotions, quick expanding of offerings and free trial offers.
- To **increase the customers' ability to buy** by means of penetration pricing, extended credit terms, heavy use of trade promotions and the offering of engineering, installation and training services.

(ii) Niche penetration

Niche penetration calls for the same advertising, sales promotion, personal selling and trade promotion activities as mass market penetration (Walker et al, 1999: 236). By employing niche penetration organisations should use more selective media and channel design to precisely direct those activities toward the selected market segment (niche).

Because the objectives of a niche penetration strategy are similar to, but more narrowly focused than a mass market strategy, the marketing elements are also likely to be similar in the two strategies. The short-term objective of niche penetration is to maximise explorers and adopters in target segments and build future volume and market share in the chosen niche. The medium-term objective is to maintain the leading share position in the target segment even if some sacrifice of short-term margins is necessary. The long-term objective is to maximise the return on investment (ROI).

(c) Market development

Market development is a growth strategy where a new market is entered by an existing product dealing with the ways in which consumers become aware of, test and eventually accept or reject a new product item. The primary objective of market development is to secure future volume and profit growth (Walker et al, 1999: 220). This objective has become even more important in recent years due to the rapid advancement in technology and more intense competition globally. A steady flow of new products and services and the development of markets, including those in foreign countries, are essential for the continued growth of most organisations.

The marketing function plays a pivotal role in the development of the market by means of speeding up innovations, and by utilising marketing strategies during the different product life cycle phases.

Chances for new market entry success by using current products are dependent upon the management of the new product development process (Jenkins, Forbes, Duranni and Banerjee, 1997: 359-378). Different types of market entries are appropriate for achieving the different strategic objectives and the following strategic scenarios as described by (Walker et al, 1999: 220-221) are possible:

- **Scenario 1:** - If the objective is to improve cash flow by adding another cash generator or cash cow as described by the Boston Consulting Group Matrix and depicted in Figure 2.3, simple line extensions or product modifications – particularly those that reduce unit costs – may be followed.
- **Scenario 2:** - If the objective is to establish a foothold in or pre-empt a new market segment, the organisation must introduce a product that is new to that market, although it may not be entirely new to the organisation.
- **Scenario 3:** - If an organisation is pursuing a prospector strategy and its objectives are to maintain a position as a product innovator and to

establish footholds in a variety of new product-markets, it should attempt to be the pioneer in as many of those markets as possible. The successful implementation of such a diversification strategy requires the organisation to be competent in and devote substantial resources to R&D, product engineering, marketing and marketing research.

- **Scenario 4:** - If the organisation is concerned primarily with defending an already strong market share position in its industry, it may prefer to be the follower. This strategy usually requires fewer investments in R&D and product development, but marketing and sales are critical in implementing it effectively.

(d) Diversification

Organisations can develop markets and seek growth by diversifying their operations. Diversification is typically more risky or it involves learning new operations and dealing with unfamiliar customer groups.

According to Walker et al (1999: 46-47) diversification can happen through:

- Vertical integration

Vertical integration can be employed by means of forward or backward integration.

Forward integration – an organisation moves downstream in terms of the product flow, as when a manufacturer integrates by acquiring a wholesaler or a retailer.

Backwards integration – occurs when an organisation moves upstream by acquiring a supplier.

- Related diversification

Related diversification occurs when an organisation internally develops or acquires another business that does not have products or customers in common with its current business but it might contribute to internal synergy sharing product facilities, R&D know-how, or marketing and distribution skills.

- Unrelated diversification

In contradiction to related diversification the motivation for unrelated diversification is primarily financial rather than operational. Unrelated diversification tends to be risky in terms of financial outcome.

- Diversification through organisational relationships or networks

Organisations attempt to gain some of the benefits of market expansion or diversification while simultaneously focusing more internally on a few core competencies. The aim is to form relationships or organisational networks with other organisations instead of acquiring ownership..

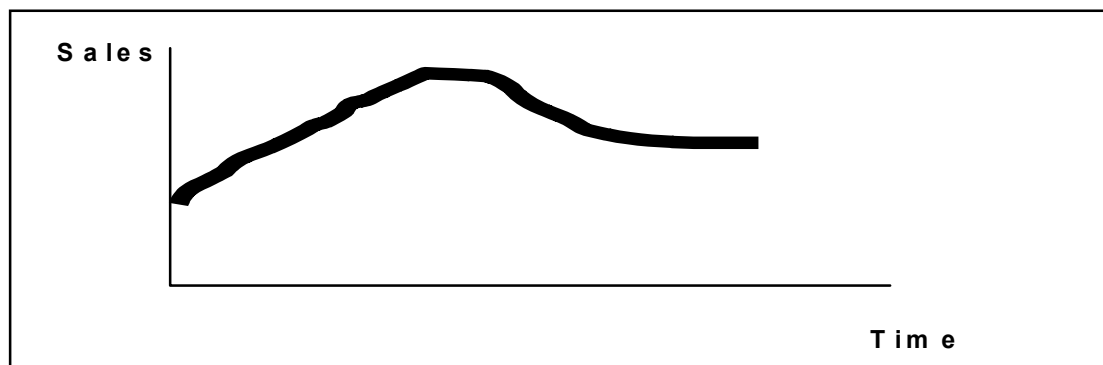
3.4 THE PRODUCT LIFE CYCLE AND GROWTH STRATEGIES

The various growth strategies as developed by Ansoff (1957: 114) have been discussed in chapter two and in paragraph 3.3. A significant contribution by linking the product life cycle to growth strategy has been made by Bass (1969: 215-227).

Bass developed a growth model for the timing of initial purchasing of new products and tested this model empirically against data for eleven consumer durables.

The growth model postulated is best reflected by growth patterns similar to the pattern shown in Figure 3.10 below.

Figure 3.10: Growth of a new product



Adapted from: Bass (1996: 216)

This model yields relatively good predictions of sales peaks and the timing of the peak when applied to historical data. The growth model shown in Figure 3.10 is best reflected by growth patterns similar to the shape of the product life cycle curve: sales will reach a peak and then level off to a magnitude lower than the peak. Bass (1969: 215) is of the opinion that long-range forecasting of new product sales is a guessing game and he therefore provided a framework for a rationale for long-range forecasting.

The growth model is based upon the assumption that the probability of purchase at any time is related linearly to the number of previous buyers. Additional information should be incorporated into the model or versions of the model, if and when available for analysis internally of the organisation. Key data include price trends, sales force expenditure, advertising expenditure and the cost data from the appropriate learning curves. Good industrial intelligence including the feedback from the sales force and primary market research must supplement any growth model. The economic environment is also critical, particularly interest rates and corporate profitability which might also impact the timing of adoption.

There is a behavioural rationale in the assumption of the Bass model that implies exponential growth of initial purchases to peak and then exponential decay. Behaviourally, the assumptions are similar in certain respects to the theoretical concepts emerging in the literature on new product adoption and diffusion as depicted in Figure 3.2. From a planning viewpoint the central interest in long-term forecasting lies in the prediction of timing and the magnitude of the sales peak. The model definitely contributed to an understanding of the process of new product adoption and may be useful for long-range forecasting.

Tigert and Farivar (1981: 81-90) tested the Bass model for growth by means of a sensitivity analysis for a high technology product with the main aim to develop a forecasting equation to aid in production scheduling and market development.

The contributions by Bass (1969: 215-227) and Tigert and Farivar (1981: 81 - 90) can be related to the discussion in paragraph 3.2.1(b) that provided valuable insight into the application possibilities of the product life cycle concept for growth and forecasting purposes.

According to Bass (1969: 226) there is a behaviour rational that the probability of purchases at any time is related linearly to the number of previous buyers. Tigert and Farivar (1981: 90) by testing the Bass model posit that the Bass model forces a disciplined approach to estimating market potential but they concluded that no forecasting model should be a substitute for other elements of the strategic planning process.

The application of the product life cycle concept for forecasting purposes will be tested empirically among small manufacturing organisations and small dealer organisations in Gauteng.

3.5 THE PRODUCT LIFE CYCLE CONCEPT AND STRATEGIC PLANNING

The product life cycle concept is an integral part of product management as discussed in paragraph 3.3 and the application of this concept for strategic planning and marketing decision-making will be tested during the empirical part of this study. To date Hofer (1975: 784-810) developed the most extensive theoretical profile of the product life cycle as it affects corporate strategy. Two of Hofer's propositions are particularly valuable, namely:

- (i) The most fundamental variable in determining an appropriate marketing strategy is the phase of the product life cycle (Hofer, 1975: 789).
- (ii) Major changes in business strategy are usually required during three phases of the product life cycle: introduction, maturity and decline (Hofer, 1975: 799).

To date authors have found no comprehensive empirical validation of the propositions by Hofer (1975: 784 – 810) or of the strategy performance

implications of the product life cycle. A study conducted by Anderson and Zeithaml (1984: 1) empirically examined differences in strategic variables between phases of the product life cycle, as well as differences among the determinants of high performance across phases of the product life cycle.

Anderson and Zeithaml (1984: 23) contented that growth businesses should consider the implications of their objectives and strategies for later phases of the product life cycle. Growth phase decisions concerning short-term profitability and market share may have a critical impact on the success of the organisation as the market matures. Also, those businesses should track the evolutionary development of the market, constantly evaluate their position and implement strategies in line with the changing conditions.

Wind (1981) in Anderson and Zeithaml (1984: 7) suggested that the life cycle concept could be used in two ways:

- (i) to assume that all products follow the life cycle and to develop strategies to sustain sales and profits rather than allowing decline, or
- (ii) incorporate information on the product position in the life cycle with other information such as market share and profitability.

The study conducted by Anderson and Zeithaml (1984: 22) provides a better understanding of the evolution of business strategy and the trade-offs that may be confronted. The starting point should be the comparison of organisational goals with the short term and long-term profit opportunities of the organisation and the various strategic business units. Findings of Anderson and Zeithaml (1984: 23-24) question the idea that a single set of strategies is preferable at any phase of the product life cycle, particularly in the growth phase.

Anderson and Zeithaml (1984: 7) derived the following major trends from a sample consisting of 1 234 small to large industrial manufacturing organisations:

- (i) Marketing strategies in the **introductory phase** emphasise a buyer focus, building on advertising and increasing purchase frequency.

-
- (ii) In the **growth phase** there is a movement toward strategic segmentation and building efficiencies in production and marketing.
 - (iii) High performance strategies for the **maturity phase** are more complex than for the previous two phases. Basically, they centre on improving efficiency in process, reducing overall cost in marketing and distribution.
 - (iv) Relatively little work has been done regarding strategies leading to high performance in the **decline phase**. Strategy depends on industry traits, on whether some segments will have enduring demand, on whether barriers impede exit of organisations and on the nature of competition.

In spite of the limited attention in the empirical research relating marketing strategy to performance within phases of the product life cycle, a number of studies have conceptually related these variables directly and indirectly. Studies that investigated strategy and performance and that have product life cycle implications are summarised in Table 3.4.

The trends cited by Anderson and Zeithaml (1984: 7) are very important but in the context of this research it will however not be included in the empirical part of this study. The researcher will use the product life cycle assumptions provided by Kotler as discussed in paragraph 1.6.1 in the introductory chapter. Kotler's (2000: 316) assumptions are – identified characteristics, described marketing objectives and propose marketing strategies during each product life cycle phase. Kotler used the publications of Weber (1976: 12-29) and Doyle (1976: 1-6) to generate his product life cycle assumptions for each phase in the product life cycle:

- Weber (1976: 12-29) conducted empirical research directed at the industry life cycle rather than the product line life cycle by using two different products – computers and razor blades.

According to Weber (1976: 13) each phase has its own marketing implications as shown in Table 3.3.

Table 3.3: Marketing implications of each phase of the product life cycle

Effects and responses	Phases of the PLC			
	Introduction	Growth	Maturity	Decline
Competition	None of importance	Some emulators	Many rivals competing for a small piece of the pie	Few number with a rapid shakeout of weak members
Overall strategy	Market establishment; persuade early adopters to try the product	Market penetration; persuade mass market to prefer the brand	Defence of brand position; check the inroads of competitions	Preparations for removal; milk the brand dry of all possible benefits
Profits	Negligible because of high production and marketing cost	Reach peak levels as a result of high prices and growing demand	Increasing competition cuts into profit margins and ultimately into total profits	Declining volume pushes costs up to levels that eliminates profits entirely
Retail prices	High, to recover some of the excessive cost of launching	High, to take advantage of heavy consumer demand	What the traffic will bear; need to avoid price wars	Low enough to permit quick liquidation of inventory
Distribution	Selective, as distribution is slowly built up	Intensive; employ small trade discounts since dealers are eager to store	Intensive; heavy trade allowances to retain shelf space	Selective; unprofitable outlets slowly phased out
Advertising strategy	Aim at the needs of early adopters	Make the mass market aware of brand benefits	Use advertising as a vehicle for differentiation among otherwise similar brands	Emphasise low price to reduce stock
Advertising emphasis	High, to generate awareness and interest among early adopters and persuade dealers to stock the brand	Moderate, to let sales rise on the sheer momentum of word-of-mouth recommendations	Moderate, since most buyers are aware of brand characteristics	Minimum expenditures required to phase out the product
Consumer sales and promotional expenditure	Heavy, to entice target groups with samples, coupons and other inducements to try the brand	Moderate, to create brand preference (advertising is better suited for this job)	Heavy, to encourage brand switching, hoping to convert some buyers into loyal users	Minimal, to let the brand coast by itself

Adapted from: Weber (1976: 13)

Table 3.3 provides a description of the various marketing implications based on the various effects and responses on the market mix variables along with characteristics on competition and profit across all four phases of the product life cycle.

- According to Doyle (1976: 5) each phase has its own marketing implications in the form of responses on the strategic focus, marketing expenditure, marketing emphasis, distribution, price and products responses shown in Table 3.4.

Table 3.4: Implications of the product life cycle

Responses	Phases in the product life cycle			
	Introduction	Growth	Maturity	Decline
Strategic focus	Expand the market	Market penetration	Defend market share	Productivity
Marketing expenditure	High	High (declining %)	Falling	Low
Marketing emphasis	Product awareness	Brand preference	Brand loyalty	Selective
Distribution	Patchy	Intensive	Intensive	Selective
Price	High	Lower	Lowest	Rising
Product	Basic	Improved	Differentiated	Rationalised

Adapted from: Doyle (1976: 5)

Table 3.4 provides a description of the various marketing implications based on the various responses on the market mix variables along with the strategic focus, marketing emphasis and marketing expenditure across all four phases of the product life cycle.

There are differences between the work published by Weber (1976: 13) as depicted in Table 3.3 and the work published by Doyle (1976: 5). The differences are:

- (i) Weber provides effects and responses while Doyle only provides responses.
- (ii) Doyle provides strategic focus and marketing expenditure responses and Weber not.
- (iii) Both authors provide marketing variable responses. labelled the promotional variable as marketing emphasis responses.
- (iv) Weber provides profit effects and responses compared to Doyle who provides marketing expenditure responses.

It is the view of the researcher, based on the above-mentioned discussion of differences, that the marketing implications (effects and responses) provided by Weber is more comprehensive than those provided by Doyle.

Based mainly on the work published by Weber (1976: 13) and Doyle (1976: 5), Kotler (2000: 316) provides a description of marketing characteristics, proposed marketing objectives and suggested strategies depicted in Table 3.5 and published in Kotler's general marketing text books since the 1980s.

The proposed marketing objectives and suggested marketing strategies are the direct result of the various effects and responses provided as marketing implications by Weber (1976: 13) and Doyle (1976: 5). Kotler's described characteristics in Table 3.5 are broader and more detailed than the effects and responses provided by Weber (1976: 13) and Doyle (1976: 5).

Table 3.5: Characteristics, marketing objectives and strategies in the various phases of the product life cycle

	Phase 1	Phase 2	Phase 3	Phase 4
Sales characteristics	Low Sales	Rapidly growing sales	Peak sales	Declining sales
Cost characteristics	High cost per customer	Average cost per customer	Low cost per customer	Low cost per customer
Profit characteristics	Negative profits	Increasing profits	High profit	Declining profits
Competitor characteristic	Few competitors	Growing number of competitors	Stable number of competitors	Declining number of competitors
Customer characteristics	Innovative customers	Early adopters	Middle majority	Laggards
Marketing objective	Create product awareness and trial	Maximise market share	Maximise profit while defending current market share	Reduce expenditure and milk the brand
Product strategy	Offer a basic product	Offer product extensions, service and warranties	Diversify	Phase out the weak performers
Price strategy	Charge cost plus	Price to penetrate the market	Price to match or beat competitors	Cut price
Distribution strategy	Build selective distribution	Build intensive distribution	Build more intensive distribution	Selective to phase out the unprofitable outlets
Advertising strategy	Build product awareness	Build awareness and interest in the market	Highlight brand differences and benefits	Reduce the level to retain loyal customers
Sales Promotion strategy	Use heavy sales promotion to entice trial	Reduce to take advantage of heavy consumer demand	Increase to encourage brand switching	Reduce to a minimal level

Adapted from: Kotler (2000: 316)

As discussed in paragraph 3.2.6(a) it is still difficult for marketing decision-makers to determine at which phase of the product life cycle a product or

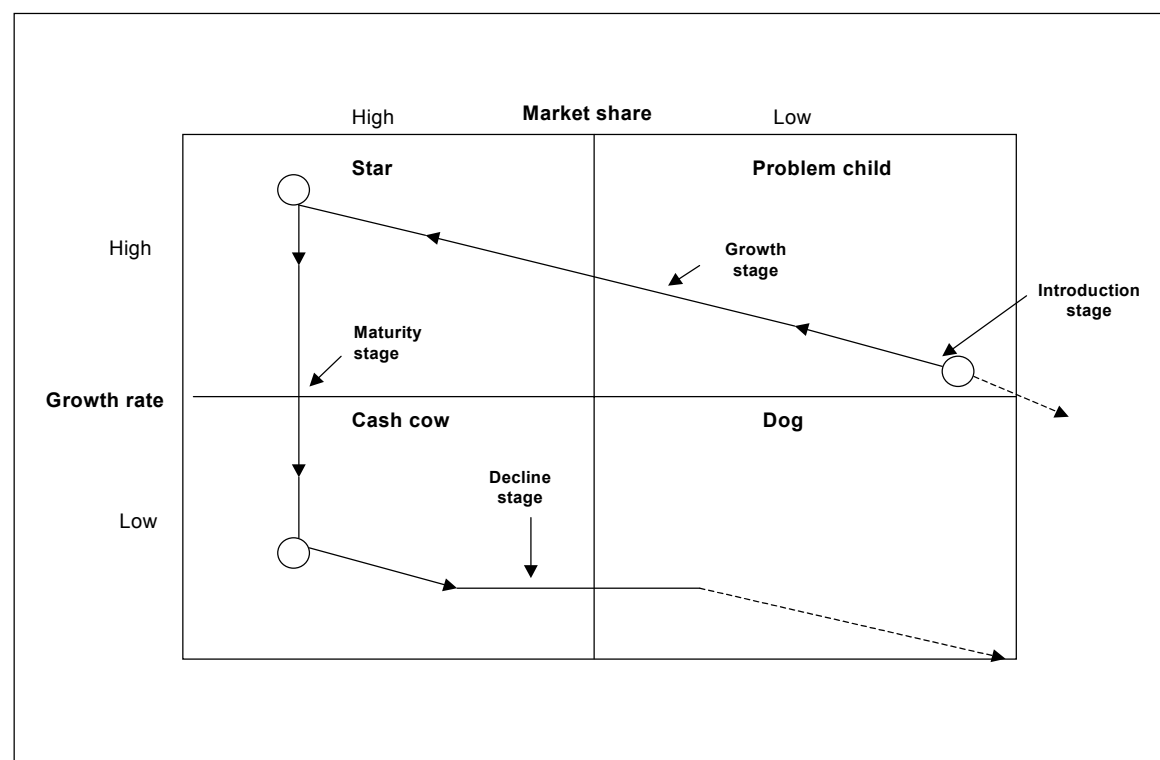
service is. Thus the described marketing characteristics, proposed marketing objectives and suggested marketing strategies to be associated with each phase of the product life cycle as depicted in Table 3.5 is still more a theory with serious doubt about it's application than a marketing decision-making tool in practice.

Table 3.5 depicted the product life cycle assumptions to be empirically tested during the empirical part of this study.

3.6 THE PRODUCT LIFE CYCLE AND PRODUCT PORTFOLIO

When the product life cycle is compared to the product portfolio concept developed by the Boston Consulting Group as discussed in paragraph 2.3.2 (a)(iii), the marketing manager can take strategic decisions with greater certainty. Figure 3.11 illustrates the relationship between the product life cycle concept and product portfolio.

Figure 3.11: Relationship between product life cycle and product portfolio



Adapted from: Van der Walt et al (1996: 521)

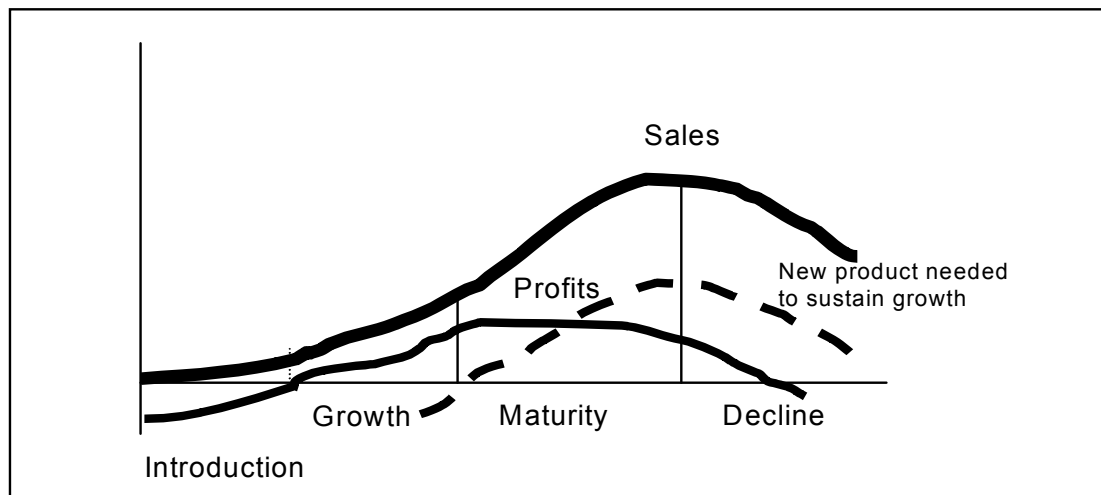
As seen in Figure 3.11 the introductory phase begins in the problem child's quadrant, the growth phase at the end of this quadrant, extending into the star area. The maturity phase begins in the cash cow quadrant and the decline phase is positioned between the cash cow quadrant and the dog quadrant.

As SBUs migrate from one quadrant to another as illustrated in Figure 3.9 there could be vital strategic implications for the organisation. These strategic implications can be related to the alternative strategies discussed in paragraph 2.3.1(c)(i) and 2.3.1(c)(ii) whereby decisions need to be taken on whether to invest, to hold, to harvest or to divest the particular SBU.

In relation to Figure 2.1 this migration will have implications on corporate strategy level. Corporate goals and objectives could need adaptation, strategies might need to be reformulated and redeployment of organisational resources would be imperative. This will subsequently have strategic implications down to the functional level in the organisation as the tactical decisions based on the marketing mix variables would be strongly influenced by the strategies formulated at a higher level of the hierarchy as depicted in Figure 2.1.

3.7 MARKETING IMPLICATIONS IN EACH PHASE OF THE PRODUCT LIFE CYCLE

Doyle (1976: 1) provides an illustration in Figure 3.12 of the various phases of the product life cycle with the underlying relationship between sales, profit and the need for new product development.

Figure 3.12: Phases in the product life cycle

Adapted from: Doyle (1976: 1)

The four different phases are characterised by the following:

- **Introduction**

- Sales of new products usually rise slowly at first
- Profits are negative
- The introductory phase might last from a few months to a year for consumer goods and generally longer for industrial products.

- **Growth**

- If the product is successful, growth usually accelerates at some point, often surprising the innovator.
- The acceleration results from:
 - (i) a larger pool of imitators
 - (ii) the broadening of the market by market segmentation
 - (iii) product improvements
 - (iv) increase in the number of distributors
- Profit margins peak during this phase as the experience curve effects lower unit costs faster than price declines.

- **Maturity**

- This phase begins after sales cease to rise exponentially

- No new distribution channels to fill
- Usually the longest phase in the life cycle
- The period over which sales are generated depends upon the ability of the organisation to stretch the cycle by means of market segmentation and new uses for the product.
- Profits decline.

● **Decline**

- Most products and brands enter a period of declining sales caused by:
 - (i) technical advances that lead to product substitution
 - (ii) fashion and taste change
 - (iii) cost factors
- Profit margins are eroded

Doyle (1976: 2) strongly indicated that if the product life cycle is to be of value for decision making, researchers must prove that the cycle is sufficiently regular to establish the following three events:

- (i) The current position of the product in the cycle.
- (ii) When turning points will occur.
- (iii) At what sales level(s) these will occur.

Variable (i) will be included in the measurement instruments of the proposed research in order to determine whether small organisations use this variable in marketing decision-making.

Doyle (1976: 3) reached the following main conclusions:

- (i) Sales of most, though not all, products broadly follow the product life cycle pattern.
- (ii) The characteristics of competition and unit profit tend to follow that postulated above, e.g. profits peak during the rapid growth phase and

problems of competition and excess capacity become more acute as the cycle advances.

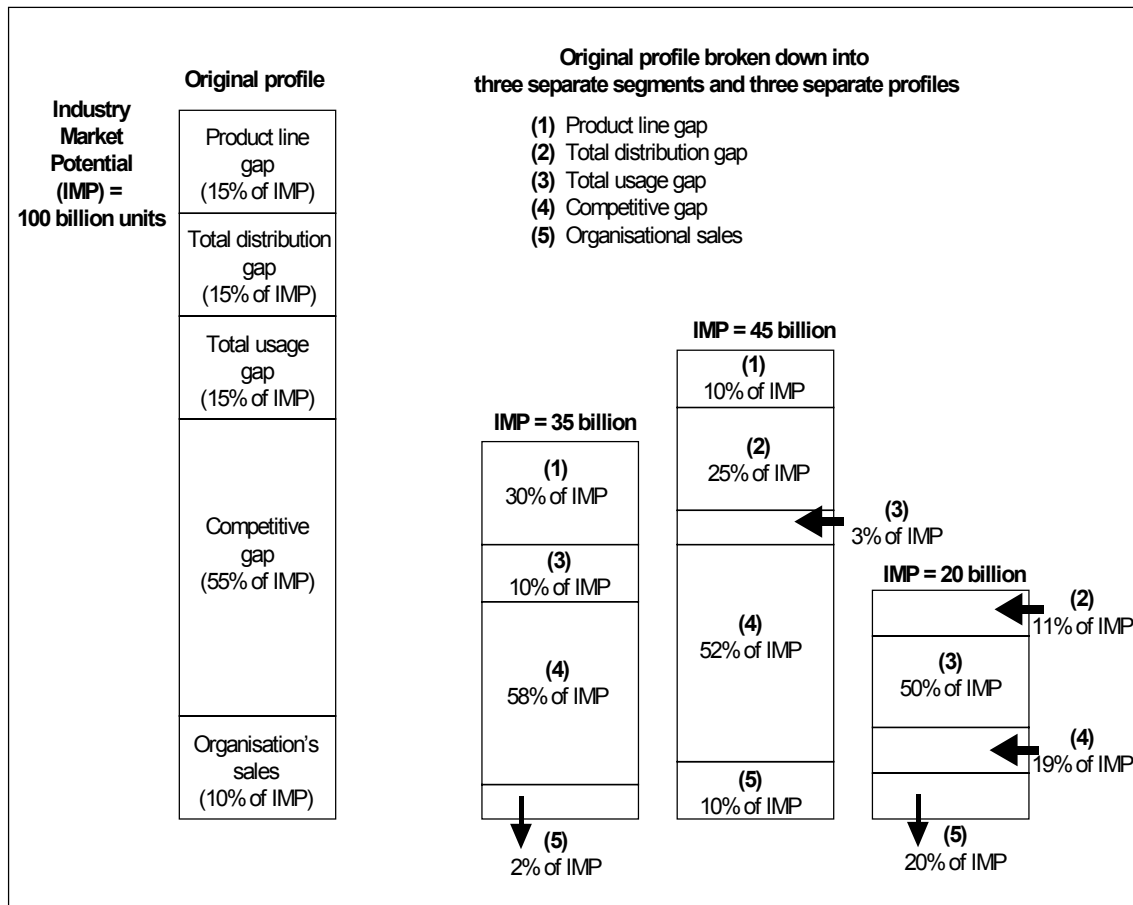
- (iii) The average length of the product life cycle tends to shorten as a result of economic, technological and social change. Products generate profit for shorter periods.
- (iv) There is no regularity across products in the length of the phases in the product life cycle.
- (v) Often the product life cycle can be temporarily bent by heavy promotional expenditures in the decline phase.

As a result, Weber (1976: 12-29) provided a new framework and new perspectives for viewing and considering all possible growth opportunities according to Ansoff's intensive growth strategies illustrated in Figure 2.6.

The framework is called the inverted product life cycle and it provides a configuration to fit competitive information available internally and externally of the organisation whereby future growth opportunities can be identified.

According to Weber (1976: 12) the inverted product life cycle process will help organisations to estimate the sales likely to result from taking advantage of available growth opportunities. The inverted product life cycle uses the traditional product life cycle concept to expand it into an analytical yet intuitive and useful tool for planning future growth as depicted in Figure 3.13.

Figure 3.13: The inverted product life cycle



Adapted from: Weber (1976: 22)

The life cycle used in the inverted process as illustrated in Figure 3.13 is the industry life cycle rather than the product life cycle where the industry market potential serves as the starting point. The inverted product life cycle framework of Weber (1976: 17-21) can be used to:

- Assist growth-planning decisions.
- Develop quantifiable growth objectives for different product lines.
- Evaluate alternative growth opportunities.
- Assist product line managers.
- Assist top management.
- Build and use inverted product life cycles for competitors.
- Assess international markets.
- Act as a new point of reference for separating market segments.

The development of accurate life cycles cannot be accomplished overnight but can be generated within a single period. Accuracy and utilisation of possible future growth possibilities will improve each subsequent year as planning personnel become more familiar with this kind of analysis as a better data base for the organisation's own life cycle is accumulated.

3.8 THE PLC CONCEPT CONTRIBUTING TO MARKETING STRATEGY AND DECISION-MAKING IN SMALL ORGANISATIONS

The literature thus far clearly indicates that the product life cycle concept was empirically tested mainly in **large organisations** as depicted in Table 3.1 and that only these organisations can reap the fruits of the correct application in marketing decision-making.

The only proof of the successful application of the product life cycle concept derived from literature is the success story of Quarterdeck Office System. Quarterdeck Office System is a **small computer software organisation** in Santa Monica, California, USA. They profess the validity of the product life cycle, the use of which they claim, saved them from bankruptcy. Quarterdeck would have been ruined were it not for management's knowledge and use of the product life cycle concept (Grantham: 1997: 8).

The company exists through serving the niche created by Microsoft. They identified the various life cycle phases of their products and continually assessed strategies that Microsoft was following. They concluded that their products worked more efficiently with older computers and for a large segment of users, who struggled to learn new programmes, as they were not willing to upgrade to the new hardware. On the other hand, Microsoft's Windows worked better with newer computer models and with software requiring more memory. On this basis, and considering the fact that Microsoft was aiming their product at the introduction and growth phases, Quarterdeck positioned its own products at the mature and declining phases of the life cycle.

3.9 THE PRODUCT LIFE CYCLE CONCEPT AND DEALERS

Dealers, similar the products they distribute, pass through an identifiable cycle and this cycle can be partitioned into four distinct phases – innovation, accelerated development, maturity and decline (Lusch, Dunne and Gebhardt, 1993: 116). These phases are similar to the phases in the product life cycle concept as illustrated in Figure 3.9.

Dealers can apply the same growth strategies as manufactures, (discussed in chapter two) as they can grow through market penetration, market development and product improvement. As derived from the discussion on product development and market development at the beginning of this chapter, manufacturers have full control over their marketing mix instruments while their products move through the various phases of their product life cycles. In many instances the degree of control by the retailer/dealer over the marketing mix instruments varies based on how prescriptive the manufacturers of a products will be on price, advertising, promotion and merchandising.

3.10 THE PRODUCT LIFE CYCLE AND SMALL ORGANISATIONS

It is eminent from the discussion in this chapter that the product life cycle concept theory and its application, as derived from literature, focused mainly on large organisations in the USA and UK. Very little evidence of empirical research conducted on the application of the product life cycle concept among small organisations was found. As indicated in the introductory chapter the primary objective of this research is to establish what the use and practical value of the product life cycle is in marketing decision-making among small manufacturing and small retail organisations. The researcher will therefore test the applicability of the traditional marketing mix instruments among manufacturers and dealers with the aim of expanding the marketing strategies to be applied to the marketing of services along the different product life cycle phases.

3.11 CONCLUSION

This chapter dealt with a literature search on product management, strategies to achieve growth along with the product life cycle concept and all its various facets. It is clear that most of the articles stem from the period 1950 to 1993, with little empirical research after 1993. This however provides the researcher with the opportunity to re-open the PLC concept debate and test the PLC concept among small organisations in the Republic of South Africa. The major theoretical aspects discussed in this chapter will be the basis for the research propositions that will be discussed in chapter five and it will have an impact on the measurement designing process that will be comprehensively explained in chapter six.