The Product Life Cycle: Its Role in Marketing Strategy/Some Evolving Observations About the Life Cycle

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Some Evolving Observations About The Product Life Cycle

The Product Life Cycle is an attractive concept, but one which the common consensus is that it has some descriptive value, but rather limited or non-existent prescriptive value. This paper is based on the premise the Product Life Concept has the potential to become a central, if not, the central concept in marketing theory and practice. Prior to making suggestions on steps toward this ambitious goal, the concept is reviewed along with its major limitations. Based on a review of research evidence published since 1975, it is suggested that three areas need to be explored and expanded. The first is a careful reexamination of the foundation of the concept, then there needs to be a focus on the product life cycle as a dependent variable, and third, there is a need from application of meta-theory criteria to guide future research.
I am absolutely convinced that the product life cycle has the potential to play a central, if not the central role in our quest to develop a solid theory based foundation for marketing practice. Furthermore, it seems possible, to speculate, that, if properly documented through research, the product life cycle could become a powerful predictive concept. Hopefully, this would lead to more efficient allocation of resources, but at the very least, result in outcomes having higher probabilities of success.

Hofer (1975, p. 798) argues that "the most fundamental variable in determining an appropriate business strategy is the stage of the product life cycle." Likewise, Biggadike (1981) identified the product life cycle as one of the five major contributions that marketing has made to strategic management. And the Boston Consulting Group's famous portfolio approach is implicitly based on the product life cycle concept. Michael Porter (1980, p.157) recognizes the product life cycle as "the grandfather of concepts for predicting the probable course of industry evolution."

Yet, with all this promise, with all this expressed confidence, many of us are very uneasy with ascribing much more than descriptive relevance to the product life cycle. Most would agree with Day in his 1981 review of the product life cycle:

There is a tremendous ambivalence toward the product life cycle concept within marketing. On one hand, the
concept has an enduring appeal because of the intuitive logic of the product birth > growth > maturity > decline sequence based on a biological analogy. As such, it has considerable descriptive value when used as a systematic framework for explaining market dynamics. However, the simplicity of the product life cycle concept makes it vulnerable to criticism, especially when it is used as a predictive model for anticipating when changes will occur and one stage will succeed another, or as a normative model which attempts to prescribe what alternative strategies should be considered at each stage. (Day 1981, p. 60)

There seems to be a common consensus that the product life cycle has descriptive value but very little prescriptive value. This is most unfortunate for a concept that has such a seemingly central role in both marketing and business strategy theory and practice. One can speculate on the reasons for the lack of predictive value. But no matter what the reasons, it is evident that we know relatively little about this basic building block of theory and practice in marketing and business strategy. Even the most cursory application of meta theory criteria suggests that this concept is almost completely lacking those elements that would allow it to be a building block in the development of marketing theory and business strategy.

The Attractiveness of the Product Life Cycle

Concepts find their way into the literature and practice for any number of reasons. But the most enduring concepts seem to closely reflect some sort of "truth" or perceived truth about how things actually are or should be.

Rink and Swan (1979) and Belville (1966) suggest that the origin of the Product Life Cycle can be traced to Joel Dean (1950, 1951). However, a careful reading of those works suggests that Dean may have recognized a concept something like the
Product Life Cycle, even though he did not explicitly label this concept.

Muhs (1985) in his attempt to trace the history of the Product Life Cycle reports that the first full exposition of the Product Life Cycle as we know it today was reported by Jones in 1957. Jones, who was then Manager of New Product Planning at Booz, Allen and Hamilton, based his thinking on data from over 300 client reports as well as an extensive review of the literature and new product data on more than 400 manufacturers and 100 professional organizations (Jones 1957, p.40). His observations on the contribution of new products to sales growth lead to the statement that:

There are compelling forces behind this drive for new products. There is a life cycle that is characteristic of many - if not most - products. Since all products are "new" at their outset, we can call it the basic life cycle for new products (Jones 1957, p. 41-42).

This basic life cycle as presented by Jones had five stages: introduction, growth, maturity, saturation and decline.

Muhs (1985) interviewed Jones in 1982 and reports that "the mortality curve, product evolution, and profit time relationships were all probably the basis for the product life cycle...but that he did remember dreaming up some of the ideas and jargon."

Muhs also reports that Otto Kleppner (1931) conceptualized an antecedent of the Product Life Cycle in his classic text, Advertising Procedure. He suggested that most products pass through the stages of "pioneering", "competitive", and "retentitive" (Kleppner 1931, p.5).

It should also be noted that consideration of the product in
marketing thought is a relatively recent development. Early marketing thought focused on commodities, institutions and functions.

Consequently, it is a fairly safe bet that the Product Life Cycle concept reflects what many observe to be reality. And eventually, it came into the literature as the Product Life Cycle. The question, however, of which we need to be ever mindful, is whether or not the observations are accurate and universal.

Defining The Product Life Cycle

At this stage of marketing theory and practice development, it is accurate to say that there is rather unanimous agreement as to the key elements of the Product Life Cycle.

1. Products move through the life cycle of introduction, growth, maturity and decline at varying speeds;
2. Unit profits climb rapidly in the growth phase and start to decline because of competitive pressure during the maturity phase;
3. The functional emphasis required for successful product exploitation - engineering and research, manufacturing, marketing, and financial control - changes from phase to phase in the cycle as shifts occur in the economics of profitability (Patton 1959).

The near unanimous agreement, however, can indicate one of two things about the Product Life Cycle. It can indicate that this is indeed a general model that fits the majority of product situations or conversely, it can indicate that it is more of a normative model, that is seldom, if ever, seen, but is nonetheless useful as a benchmark to test strategy against. In this latter sense, it would be similar to the economic concept of pure or perfect competition. Pure or perfect competition
probably have never existed, but the concept serves a useful purpose by allowing us to compare the outcomes of other types of competition against the outcome of pure or perfect competition.

Fortunately, some literature is beginning to emerge to assist us in assessing the usefulness of the Product Life Cycle. It is my intention to briefly review some of this literature and then offer some suggestions as to where we must go from here.

Common Knowledge

There have been several reviews of the Product Life Cycle over the years. Rink and Swan (1979) in their review of the literature identified eleven different product life cycles. One of the more extensive to be published to date is that of Meenaghan and Turnbull (1981). As part of an empirical investigation of the applicability of the Product Life Cycle to "Popular Record Marketing," they review the theory with its attendant problems.

Probably the most well known work dealing with the Product Life Cycle is Chester Wasson's Dynamic Competitive Strategy and Product Life Cycles (1974). Unfortunately, the literature review in support of Wasson's work is rather sparse.

One cannot completely blame Wasson, however, for including relatively few references in his major statement. For whatever reason, I can find less than 100 references to the Product Life Cycle up to 1974. However, I was able to identify well over 300 references to the Product Life Cycle since 1975. Over 200 of these references appearing since 1975 appear in credible academic and trade journals and major monographs.
The Literature

The Product Life Cycle literature is varied and diverse. The earlier literature tends to be more optimistic about the usefulness of the concept while the more recent literature is concerned about its limitations, but also with developing a better understanding of the concept through empirical research.

Weakness & Criticisms:

The Product Life Cycle has been criticized by a number of writers, for a variety of reasons. Of course, some of the criticisms are more fundamental than others. The criticisms seem to fall into the following categories:

- level of aggregation It is not clear whether the concept is most appropriate for product class, product form or brand. Tellis and Crawford (1981, p. 126) suggest that "authors generally feel that product forms bear the closest approximation to the PLC, individual brands are difficult to model, and patterns at the level of product class are less apparent because of the longer sales trends involved." However, Polli and Cook (1969) report being able to identify separate life cycles for product class, product form and brand for cigarettes.

- self-fulfilling prophecy Dhalla and Yuspeh (1976) cite evidence that suggests for consumer goods, their decline is not inevitable. The belief that goods will decline often leads to premature cutbacks in marketing and advertising support according to Dhalla and Yuspeh which leads to a self-fulfilling prophecy of decline. They argue that in many cases appropriate use of advertising and other marketing tools can prevent the decline
stage. Cannon (1978, p. 238).............. Tallis and Crawford (1981, p. 131) feel strongly that, "the death stage of the PLC need never be accepted as certain except when all other innovative modifications fail to provide a profitable alternative, as in the special case of fad and fashion products."

Wiersema (1982, p. 21) also argues that:

The simple assumption that sales growth will decline over time and will affect a variety of strategic and performance variables in a predetermined way is deceptive in that it overlooks the arbitrary nature of unit of analysis selection, the effect of unsystematic changes, and the fact that marketplace dynamics may be driven by at least three regular maturation tendencies that do not necessarily move in tandem.

For Wiersema, the three maturation tendencies are demand, technical and competitive (Wiersema 1982, p. 22). And then there is the belief supposedly held by Proctor and Gamble that the Product Life Cycle does not exist.

- not a model Hunt argues that the typical explanation of the Product Life Cycle is "vacuous" because, in essence, "if the level of sales determines the stage of the life cycle, then the stage in the life cycle can not be used to explain the level of sales." (Hunt 1983, p. 131)

- validity In their review of the literature, Tellis and Crawford (1981) found little conclusive evidence to support empirically the Product Life Cycle.

- oversimplification of the product growth process Meenaghan and Turnbull (1981, p. 9) charge that "the methods of stage identification are unlikely to provide management with a solid base upon which to plan future strategy." This is very similar to the arguments of Wind and Claycamp (1976).
- time as the principle variable Meenagahan and Turnbull (1981, p. 9) argue that "the shape of the life cycle curve will ultimately be determined by a host of industry, market and environmental factors." This is consistent with the argument of Wiersema (1982, p. 19) when he states that the three interrelated tendencies of demand maturation, technical maturation and competitive maturation occur along approximately parallel time paths. Wind and Claycamp (1976) suggest that "traditional (PLC) analysis ... ignores the competitive setting of the product, the relevant profit consideration, and the fact that product sales are a function of the marketing effort of the firm and other environmental forces." And Parsons (1975) clearly states that the "sales curves is not a function of time alone. External environmental factors and controllable marketing instruments determine the stage of the sales response curve."

- failure to relate to adoption theory Meenagahan and Turnbull (1981, p. 9) point out that often "the factors determining market adoption ultimately determine the life cycle shape and duration."

- does not apply to all product categories Cannon (1978) suggests that "the history of products ranging as widely as steel, aluminum, glass, shoes, bread and others bears little resemblance to the Product Life Cycle. The overwhelming bulk of evidence suggests that demand for these key products is more a function of economic circumstances than life cycle."

Taken as a whole, these criticisms paint a rather bleak picture. Many would be forced to agree with Arora when he states:
Thus the concept of the product life cycle has limited usefulness in terms of either a planning tool or a predictive or forecasting tool because the theory at present cannot predict the performance of the brand over its life cycle as a function of marketing mix and relevant environmental factors. (Arora 1979, p. 5)

But, even recognizing the serious nature of these criticisms, research over the last few years is attempting to address these problems while at the same time advancing our understanding of this important concept.

Some Research Evidence

Much of the research on the Product Life Cycle does not fit into nice neat categories. Consequently, some of the research reported below may seem to have received a rather arbitrary classification. What follows is not an exhaustive review of the Product Life Cycle literature. Rather, it is intended to be illustrative of the types of literature associated with this concept.

Advertising

Mickwitz (1959) was the first to suggest that the demand elasticities of the managerial decision variables will differ as a product moves from one stage of the Product Life Cycle to the next. In an attempt to empirically test this assumption, Parsons estimated a sales response function using non-linear least squares. His findings "supports the theory that demand elasticities change over the product life cycle. Time-varying elasticities generally mean that marketing effort in the early years of the product life cycle should be greater than would be suggested by constant elasticities. This shift in expenditures also serves to raise the barrier to entry of imitative new
products" (Parsons 1975, p. 480). Optimal advertising sequences were found using this approach.

Using ethical drug products as his source of data, Arora (1979) also addressed the questions of elasticities. He looked at the elasticities for the use of journal advertising, direct mail, and detailing. A time varying model was found to predict higher profits than the more traditional constant elasticity model. For instance, "elasticity of journal advertising is maximum when the product is introduced; it approaches zero after 22 months since introduction. Elasticity of journal advertising equals that of detailing and direct mail at, respectively, about 8 and 15 months since the introduction of the product." (Arora 1979, p.60)

In a somewhat novel approach, Renforth and Raveed (1983) addressed the question of why "advertisements in a country such as Ecuador are more informative than those in the U.S. and Australia?" They found a larger number of products in the earlier stages of the product life cycle in Ecuador versus the U.S. and Australia with a consequent higher information content for the products in the earlier stages of the cycle.

Earlier studies by Mackenzie (1971), Montgomery and Silk (1972) and Parsons (1974) also address various advertising related issues in the context of the Product Life Cycle.

Price

From Joel Dean's classic, "Pricing Policies for New Products," (1950) there has been an assumption that the role of price varies due to different elasticities at different stages of
the Product Life Cycle. In their review of the relationship between price and the Product Life Cycle, Schafter and Roper (1985) come to the following conclusions:

1. On introducing a new product, the price should be set as high as possible and there should be intensive advertising activity.

2. During the transition from maturity to saturation, downward movements in price occur according to the various elasticities of the situation. In fact competition price differences become important to buyers, and a seller's discount and service policies become important marketing strategies. Cutting back upon these policies without regard to the life cycle of the product could be detrimental to the seller.

3. At the saturation level, a market price has emerged for the standard product which must be accepted by the producer if production is not to cease. (Schafter & Roper 1985, p.14).

Several authors report research in support of these conclusions. For instance, Simon (1979) in a study using 43 German products, built a dynamic sales model. His findings give support to the conclusion that the magnitude of price elasticity decreases in the introductory and growth stage, reaches its minimum at the maturity stage, and increases during the decline stage. Dino (1985) tests the hypothesis that the price evolution of a new product is linked structurally to stages of the Product Life Cycle. He used, radios, television sets and VCR sales in the United States. He identified three stages of price decline in these electronic product markets which can be associated with the introduction, take-off and growth, and maturity stages of the product life cycle. And Wernerfelt (1985) used a mathematical representation of the BCG hypothesis. He found that prices will decline early in the product life cycle and may increase later in
Using the PIMS data base, Farris and Reibstein (1979) found:

A stronger relationship between relative advertising and relative price levels when products are in the late stage of the life cycle than when they are new to the market. In new product categories, a considerable amount of confusion with respect to price is likely to exist in the market. Also, prices are probably changing fairly frequently.

Thus, the earlier the stage in the life cycle, the more confused the relationship between relative advertising and relative pricing (Farris and Reibstein 1979, p. 178).

In an empirical study, Doland and Jeuland (1981) presented a general methodology for determining the optimal pricing strategy over the product life cycle given evolutionary forces in the environment. They also derived the optimal pricing strategy for some well known dynamic models.

New Products


Product Life Cycle/Strategy Interface

In the Special Issue of the Journal of Marketing in 1981 focusing on the Product Life Cycle, Day (1981) stated:

To enhance both the descriptive and explanatory value of the concept, much more attention needs to be directed toward understanding recurring patterns of
successful strategies organized according to the stages of the life cycle models that are adapted to differences in the important underlying forces (Day 1981, p. 65).

In that same issue of the Journal of Marketing, at least two sets of authors did address these issues. Harrell and Taylor (1981) set out to demonstrate "a method of constructing a model that will effectively predict the industry volumes of a newly introduced dproduct through each stage of its life, based on various marketing assumptions." (Harrell and Taylor (1981, p. 68) And Qualls, Olshavsky and Michaels (1981) emperically demonstrated that the product life cycle's length has been decreasing over the last 50 years.

Since 1981, three major articles have appeared that also address the issues raised by Day. Interestingly, however, all appear outside the traditional marketing literature, indicating the strong interest students of business strategy have in this concept. Using the PIMS data base, Anderson and Zeithaml (1984) examined 24 strategic variables for their importance in explaining ROI and relative market share at the growth, maturity and decline stages of the product life cycle. Four of these strategic variables were explicitly marketing variables, while at least six others are often considered to be marketing variables or closely related to the marketing function. Significant variables were different for each stage with the resulting implications "that modifications in strategy between certain stages of PLC are both prevalent and advisable" (Anderson & Zeithmal 1984, p. 21).

Also using the PIMS data base Hambrick, MacMillan and Day examined strategic attributes and performance within the context
of the four cells of the BCG matrix. In their first study (Hambrick, MacMillan & Day, 1982, p. 528) they report:

The four types of businesses differ markedly in their strategic attributes. Some attributes (e.g., R&D expenses, plant and equipment newness) vary according to life cycle stage. Some (e.g., domain breadth, vertical integration, relative marketing expenditures) vary according to market share position. Still others (e.g., capacity utilization, sales/employee) vary according to both dimensions.

While their second study attempted to extend empirical evidence on the BCG matrix, MacMillan, Hambrick and Day (1982) several of their findings are directly relevant to the product life cycle:

For sales force expenses, the actual coefficients generally are negative for all cells (true also for growth businesses). For advertising and promotion expenses there are only significant (negative) coefficients for mature business. Apparently the impact of sales force efforts is insufficient to expand the market enough to help profits of growth businesses. In contrast, the greater reach of advertising allows a recouping of the direct arithmetic impact of such expenses on profitability for growth businesses. (page 744)

High relative sales force expenses neither help nor hurt profits of high growth businesses. Possibly the additional sales efforts help to expand the market enough to offset the additional costs. On the other hand, CFOI [cash flow on investment] for dogs is hurt by high relative sales force expenses. Apparently market share and customer loyalties are too entrenched for a dog to be able to profit from outspending its large competitors in the selling effort (MacMillan, Hambrick & Day, 1982, p.750).
Applications

There have been various attempts to apply the Product Life Cycle concept in recent years. These attempts seem to fall into four categories: empirical, trade press, conceptual and major consulting firms. We will not discuss the trade press treatment, even though it is rather extensive indicating a strong interest in this concept by managers.

The empirical studies are a mixed group. Two studies illustrate this diversity. Mercer (1985) for instance, studied the UK windsurfer market using the product life cycle as the basis for his investigation. He reports that "the product life cycle provides an accurate description of the windsurfer market for product class and form, but not for brands. It accurately explains the increase in competitors, the reduction in prices, the pattern of profits, and the increase in retail outlets" (Mercer 1985, p.21). In yet a different approach, Karnani (1984), uses a dynamic, game-theoretic model of marketing competition. He presents evidence to show that market share "decreases very rapidly during the growth stage of the life cycle and less rapidly during the later stages. This supports the conventional wisdom that a firm should try to build market share during the growth stage. In fact [it] can be interpreted to mean that it is important to build share as early as possible in the growth stage, since the value of market share decreases most rapidly during that period (Karnani 1984, p.708).

The conceptual literature really is at two levels. The
first is the single article addressing a specific issue. For instance Weber (1976) argues that firms should extend their vision beyond the present. To do this he urges the focus should be on "product line gap" rather than the more traditional "usage gap." He then offers a framework for assessing market potential within the context of the product life cycle and provides a detailed procedure for implementing an "extended" understanding of the product life cycle. In another conceptual piece, Yelle (1983), uses historical data for the production of Ford automobiles to argue the advantages of combining the product life cycle with learning curves. And a different perspective is offered by Gillingham (1985) who argues that marketing expenditures should be treated as investments, using the product life cycle as a guide. And fairly typical of this category is the call by Enis, La Grace and Prell (1977) to adjust our thinking about the product life cycle. They argue that first it is imperative to view it as a dependent variable, i.e., the result, rather than the cause of, marketing strategy decisions. They also argue that the product life cycle must be confined to the analysis of product brands, because brands are what managers make decisions about.

The second level of the conceptual literature can loosely be identified as "significant" monographs. The earliest of these, of course was Chester Wasson’s Dynamic Competitive Strategy and Product Life Cycles (1974). More recently we have seen Hofer and Schendel’s Strategy Formulation: Analytical Concepts (1978),
Michael Porter’s *Competitive Strategy* (1980), Levitt’s *The Marketing Imagination* (1986) and Day’s *Analysis for Strategic Market Decisions* (1986). In each of these, the Product Life Cycle concept is central to prescriptions for the firm. Each in some way has extended the Product Life Cycle to make it more usable in practice.

The major consulting firms certainly have incorporated the Product Life Cycle in their matrices. The most well known, of course, is that of the Boston Consulting Group. But we also find elaborate matrices from firms like A. T. Kearney.

**Where Do We Go From Here?**

After spending considerable time with the product life cycle literature, I have three observations to offer. The first, is stated nicely by Barksdale and Harris (1982, p. 76):

> While attitudes toward the product life cycle differ, the model is widely accepted by practitioners and educators as an important construct because it helps conceptualize the growth patterns of products. At the same time, it is generally recognized that the predictive power of the life cycle is low and its value as a framework for strategic planning is limited.

The second observation is less obvious. With the possible exception of studies using the PIMS data base, the great majority of studies appear to focus on products in the later stages of growth and maturity for brands or firms that would generally be described by Kotler (1984, pp. 383-413) as market leaders or market challengers. Consequently, we know little about introduction, early stages of growth, later stages of maturity (often referred to as saturation) and products or firms that are
primarily followers or nichers.

The third observation is that there is little conscious thought seemingly being given to find ways to link the product life cycle with the diffusion of innovation.

A simple call for more studies, no matter how loudly or eloquently stated, will unfortunately not adequately address the criticisms and limitations so widely shared. What seems to be needed is progress on two fronts. The first is an attempt to understand the phenomena that has made the product life cycle explanation so intuitively appealing. And then proceed to an exploration of whether or not the product life cycle, is indeed, the best model of that phenomena. This may possibly lead to a major reconceptualization of the concept.

The second front seems to be research that focuses on the product life cycle as a dependent variable. Using historical data, it is important to start linking the product life cycle to marketing variables. But it is also important, to link the cycle to competitive as well as environmental variables.

And then, some wise scholar will be able to start applying meta theory criteria to this concept, and hopefully discover that we have indeed moved well beyond viewing the product life cycle as a "vacuous" concept.
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