# CHAPTER 4 - Internal analysis and resource capability audit

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## 4.4 The product life cycle

**Active reading.** Note the accounting techniques that can be used to aid the development and launch of new products. Also, make a note of elements of the task environment and the business ecosystem that have important roles in the management of the product life cycle. Think about the impact of the increased awareness of sustainability on the product life cycle.

**Video link** Product life cycle

[https://www.youtube.com/watch?v=qis6HfkijBM]

The product life cycle (PLC) is a commonly referred to model and represents the life of a product from initial launch to eventual decline. The representation that is often referred to includes the four stages of the product sales life cycle: introduction, growth, maturity, and decline (Figure 4.1). A development/design phase has been added at the start of the life cycle (Kaminski and Rink, 1984), which reflects the significance, and impact, of product development and design on the sales life cycle. Techniques such as target costing (section 7.8) and life cycle costing (section 7.9) provide considerable support at the development stage. Certain industries such as pharmaceuticals and automotive vehicles traditionally have lengthy and costly product development times, although these are becoming shorter. The high levels of development costs make it desirable to extend the product life cycle for as long as possible.

Figure 4.1 illustrates the typical stages of the sales product life cycle. The top line indicates sales growth, typically measured in sales value. The bottom line represents cash, which can also be indicative of profit. This line illustrates that at the introduction stage, due to initial marketing expenditure and low sales, the product is using, rather than generating cash (or making a loss). As the product sales grow, and the marketing strategy changes from one of awareness to building brand loyalty, the product begins to generate a positive cash flow (or profit) as the total value of sales revenue begins to outpace the costs. Once the product reaches maturity, it is hopefully generating positive cash flows and profits, which decline as the product becomes out of date or loses its market appeal, and sales volumes decline.

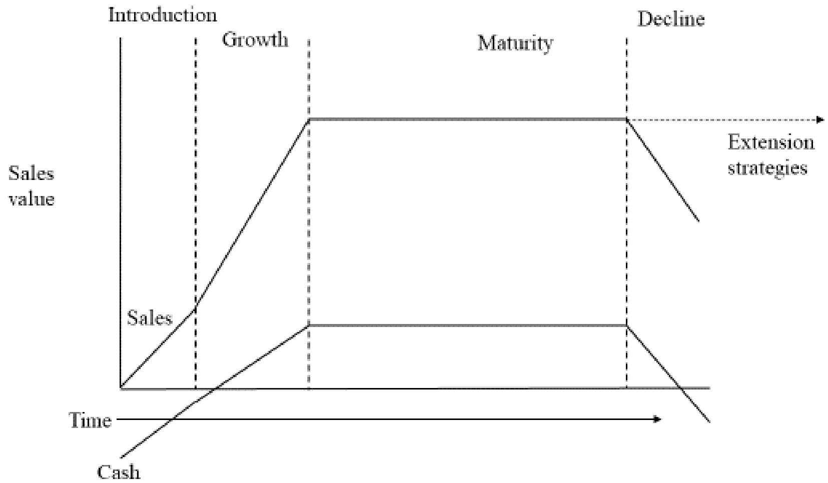


Figure 4.1 The sales product life cycle

The product life cycle is not just a framework that aids the deployment of marketing and operational strategies depending on where in the life cycle a product might be but should be used in conjunction with customer relationship management and supply chain management. Srivastava et al. (1999) emphasized the need to link product development and life cycle management with customer relationships not just as a strategy for building customer loyalty and extending the product life cycle, but as a means of gathering feedback for future product development purposes.

Minor product developments are frequently used as part of the extension strategies to keep the product alive and customers interested. In like manner, supply chain management does not just ensure that resources are available to match the growth in sales volume to meet customer demand but also provides valuable input to product development. Restuccia et al. (2016) go a little further. They stress the importance of obtaining feedback through the intermediaries, particularly distributors, as they can provide valuable feedback, for example, on ease of product handling, storage, and transportation.

Product life cycles have been getting shorter in recent years due in part to increased product complexity, increased global competition and demanding customers, increasing use of outsourcing providing flexibility and reducing the need for an organization to generate high sales volumes to cover the investment in dedicated plant and equipment, and the expanding number of business partners within the business ecosystem that contribute to the customer experience (Teresko, 2004). As a result, managing the product life cycle and the product portfolio has become a strategic priority in recent years (Jüttner et al., 2006). Many organizations will have multiple products, and if not carefully managed, the upper and lower extremes of demand could occur at the same time.

Therefore, the timing of a new product launch, upgrades, and degree of marketing support all need careful management.

Technology and consumer electronics (Chien et al., 2010) and fashion apparel (Şen, 2008) are examples of industries that typically have short product life cycles. In the case of fast fashion items, these can be noticeably short, and as a result, this industry sector has been receiving criticism from a sustainability viewpoint (McNeill and Moore, 2015; Pal, 2016). There is a growing demand for sustainable products, which is due, in part, to increased public awareness of sustainable development (De Medeiros et al., 2014), not just for fashion products but for all industry sectors. This awareness of sustainability issues has implications for the length of the product life cycle, and the disposal, or recyclable aspect, of the product at the end of its original purpose as organizations seek to become, and seen to be, more socially responsible (Campbell, 2007). Indeed, products with sustainable characteristics could now constitute a source of competitive advantage (Bevilacqua et al., 2007; Gmelin and Seuring, 2014).

### 4.4.1 Strategies for managing the product life cycle

**Active reading.** Note the strategic intent and the tactics that can be used at each stage.

In Chapter 2, the strategies of build, hold, and harvest (Gupta and Govindarajan, 1984) were highlighted (shown in Figure 4.2) as being appropriate for the product life cycle.

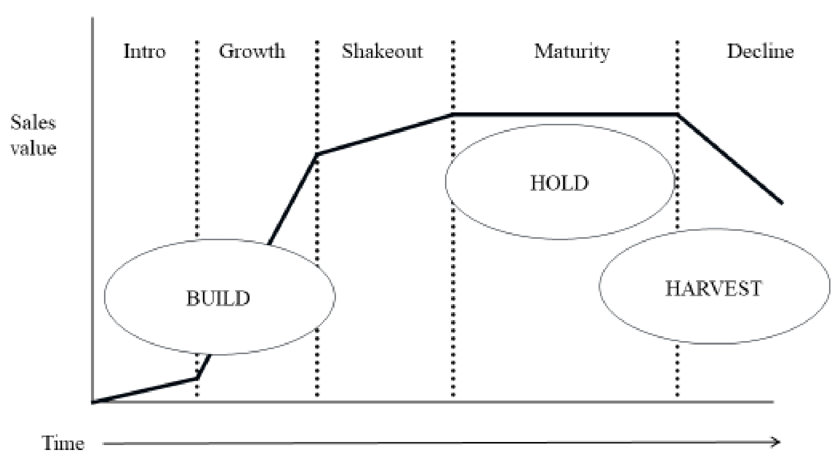


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Figure 4.2 Strategies at stages of the life cycle

The representation in Figure 4.2 brings in an element of the market life cycle to include the shakeout phase. Typically as a market develops and shows signs of growth and profitability, it attracts new entrants, but as the market growth slows the weaker competitors get shaken out of the market, often due to a lack of resources to match the growth, or the inability to gain sufficient market share to enjoy economics of scale. This shakeout can lead to the mature stage being dominated by a few large organizations. The strategies outlined by Gupta and Govindarajan (1984) are summarized in Table 4.1.

Table 4.1 Typology of strategies from Gupta and Govindarajan (1984)

| | |
|---|---|
| Build | Strategy to increase market share, invest in capacity, best in high growth industries |
| Hold | Strategy to maintain existing market share, competes by effective marketing campaigns, minor product developments to maintain market interest, best in mature industries |
| Harvest | Focus on short term earnings, minimizing investments, relatively high market share, best in declining industries |

**Build/invest**

A build strategy, as the label suggests, attempts to build the market share of new products, which requires investment in marketing and resources, hence the cash using aspect of this phase. A key factor is the ability to meet increased demand as the market and market share grows. This requires coordination through the supply chain to ensure that organization's suppliers can also match the growth, as there is nothing worse than developing a new product, only for competitors to quickly copy the product and satisfy the growing demand. This highlights the significance of developing a product or service that is difficult to replicate, thus gaining a competitive advantage, which allows time for brand awareness and customer loyalty to be built before competitors enter the market. Barriers to entry, such as product or technology patents, can also give time for the product to recoup some of the development costs before competitors developing similar products.

The build strategy is also appropriate as products move through the growth phase and into maturity. The strategy is to continue to build the market share. Therefore, investment is still required to increase the capacity and build brand loyalty via the marketing strategy. The growth in the product sales and market for the product will attract competitors to the market. As the weaker competitors are shaken out of the market, the focus is on retaining customers so that when the market matures, the organization maintains a dominant position. If the investment is cut back, the danger is that competitors will capture the growth in the market.

**Hold**

A hold strategy, as the label suggests, seeks to maintain the current market position and a high level of sales. This strategy involves encouraging repeat purchases and maintaining customer loyalty, which in some consumer markets today, such as broadband provision, mobile phones, insurance, also involves managing the customer churn rate. It is at this stage that extension strategies such as minor product developments and market development (section 7.4) can be employed to keep the market alive.

**Harvest**

A harvest strategy seeks short-term earnings and profits at the expense of long-term development. This often involves a discounting or promotional policy to maximize sales revenue. Using the farming analogy illustrates that if a product is harvested, it requires a new product to replace it. This strategy is often appropriate for end-of-line products that are being replaced by a new model.

### 4.4.2 Management accounting and the PLC

**Active reading.** Note the range of management accounting techniques and strategy models that can be used to support the strategic management of product life cycles. They are not used in insolation but used together to supplement and complement each other.

**Management accounting at different stages**

Management accounting techniques must be applied appropriately to business decisions, and as the product life cycle progresses, different techniques may have more relevance. For example, before the introduction phase, management accounting techniques can provide considerable support to the evaluation of potential new products and assistance at the development and design phase. Techniques such as investment appraisal in the form of net present value calculations, discussed in section 8.5, can be undertaken to help assess the viability of a new product, or the timing or manner of the launch by investigation different options using investment appraisal and real options theory (section 8.6). Scenario analysis (section 3.15) is also useful here, particularly where data and the experience from previously launched products of a similar nature could be used in estimating the growth patterns and potential costs at various stages. Life cycle costing (section 7.9) where the costs are considered from design right through to disposal or recycling, and target costing (section 7.8) where the desired profit margin is deducted from an anticipated market price to derive a target cost for a viable product offering, are highly relevant at the development and design stage. Techniques such as breakeven point or cost-volume-profit (CVP) analysis (see Appendix B) are also useful in assessing product viability.

Investment appraisal techniques are still relevant at the growth stages, perhaps linked with real options analysis (section 8.6), as again, there are alternative options available, such as withdrawing a product from the market instead of making further investment. At this stage, it is essential to monitor the profit margins earned on products as, if competitors have entered the market, the price, as well as the functionality of the product offering, may become more relevant to the customer choice. Competitors may use price as a weapon to gain a foothold in the market. However, if volume sales can be built before the competition obtains a strong presence in the market, the first mover can use price as a preemptive strike or as a defensive weapon as there may be more room to move on price due to the volume sales.

At the maturity stage, cash generation, maintaining margins and ensuring that the profitable customers are nurtured and retained through customer profitability analysis (section 4.7), product and customer portfolio management (sections 4.5 and 4.8), and customer relationship management. It is at this stage that extension strategies and the elements of the marketing mix, such as product, price, promotion, place, physical evidence, processes, and people, can be adjusted to maintain customer interest and attract new profitable customers to counter customer churn. Management accounting can assist the marketers in their endeavors to extend the life cycle by helping to evaluate the impact of adjustments to the marketing mix.

At the decline stage, freeing up cash flow, containing costs, and perhaps managing a strategic withdrawal of the product becomes more important. Withdrawing a product from the market, however, is not an automatic decision for declining products, as the reason for decline needs to be investigated. Often declining sales are market-led rather than product-led; that is, an environmental change causes the market to reduce. A reasonable profit stream can often be maintained for some time from products that serve a declining market, especially if the market becomes a niche market that is preferred by a select demographic of consumers. There is also the possibility of the market reviving. For example, vinyl records appeared to decline but is now a growing market again, reportedly due to the actions of purists who consider vinyl to provide a superior sound and prefer the tangibility of the product.

### Production pattern and inventory decisions

Once a product has been developed and the market testing carried out (if applicable), the organization has a decision to make as to the inventory and production pattern with its related impact on finance and cost. If the product is marketed in such a way that the anticipated sales upon launch will be high, then a significant volume of products might need to be manufactured in preparation for the launch. If the product does not sell well, then there will be a high inventory level taking up space and tying up capital, which might have to be scrapped and written off if not sold. An alternative approach might be to gear up for very flexible manufacturing such that replacement inventory can be manufactured at short notice to satisfy demand. Organizations such as Dell and Zara operate on a "produce to demand" principle. The concept of lean manufacturing and lean accounting (section 6.7) can assist when dealing with a customer-focused demand-pull system of production.

The initial production volume and production method decision are crucial as there could be a lot of wasted marketing effort and investment in creating demand for a product that is satisfied by a competitor because the organization cannot satisfy the demand it has generated. The accountant needs to work very closely with marketing and production staff to ensure that the costs and benefits of various strategies are understood. The same is true for the provision of a new service in that the resourcing decision related to the provision of skills to meet growth in the market is just as significant, that is, it may take time to recruit sufficient staff and undertake any training required to deal with a surge in demand. During this time, sales are being lost.

**Pricing decisions**

The initial pricing decision is critical; for example, whether to go for a high price associated with market skimming or a low price targeted at market penetration (section 6.4). Choosing a pricing strategy that can be maintained throughout the product's life, allowing for promotional adjustments from time to time, can be critical in positioning the product in the market as well as the long-term viability of the product. Maximizing and maintaining the contribution (or gross margin) per product can be vital to the cash generation and profitability of the product as volume increases, and the average cost per unit reduces. Understanding the dynamics of this in a specific market can feed into future product developments, and target costing analysis, as the experience of the cost behavior, linked to marketing strategy, is gained through monitoring product launches over time. As organizations begin to develop a better understanding of the cost behavior of the organization and the market sector, this can be applied to competitor analysis (section 3.11), and competitor costs can be estimated with a higher degree of certainty.

**Cost implications of competitive strategy**

The level of competition and structure of the market can change as the product/market life cycle progresses, requiring a review of the strategy. For example, in the early stages of the product life cycle, competition is often based on price. The initial product, such as the first mobile phone, is often quite basic. For example, early mobile phones only made telephone calls and allowed SMS messaging. Once the new product is launched, competitors copy the concept and produce similar products with much the same functionality.

As the product moves through growth to maturity and the market price ranges are established, competition tends to move away from price toward product differentiation, that is, mobile phones are developed with different features and functionality. For example, new features such as cameras are added such that the fact that they make telephone calls is now incidental to the purchasing decision. This shift in the importance of features can have implications for pricing as the first phones were mostly provided with little cost to the consumer, and costs were recouped via the tariffs charged for calls made. As competition and the sophistication of the product increased, the charging mechanism changed so that now the consumer pays for the phone, usually over some time in the form of a credit agreement. The competition now focuses not just on the quality of the physical product, but on the service provision, unlimited calls, texts, internet access, and so on, and the monthly tariff charged.

This scenario was also the case for TV set-top boxes, which went the other way where the original providers charged for the box to recoup some of the initial development costs, then as other competitors entered the market the boxes began to be provided for free, but a charge was made if the contract was changed within a specified time. Now the technology is provided for a minimal upfront cost to the consumer, and the cost recouped via the monthly subscription, but still within fixed-term contracts.

The technology sectors such as mobile phones, broadband provision, and subscription services are among the sectors where customer churn is highly relevant as providers compete for new subscribers with lower introductory offers. The concept of bundling has also become popular in this sector, such as buying broadband, mobile phone, and TV subscription services together. The financial implications of these strategies need to be understood by the decision-makers.

**Differentiation and fragmentation of the market**

Towards the end of the growth phase and into maturity, the development of products for different segments of the market becomes more relevant, for example, mobile phones targeted at teenage boys with ease of online game playing, or those aimed at the business market with personal organizers and other functions useful for the busy executive. This segmentation of the market is linked to the process of fragmentation as product variations are targeted at specific segments of the market. When fragmentation takes place, the cost base changes due to the loss of some economies of scale that were achieved from the production of a single standard product. When a range of product variations are required, the economies of scale can be lost, causing the cost base to rise.

Sports shoes provide an excellent example of the fragmentation of the market. One only needs to look at the range of different shoes available for your chosen sport. Not so long ago, when jogging became extremely popular, the demand for trainers or running shoes grew. This market has grown to the extent that there are running shoes targeted at the way you put your foot down when you run. For example, you could be a front foot, midsole, or heel striker. Or pronate (inward roll of the foot), supinate (outward roll of the foot), or neutral strike. Add to this a range of different terrains, and the range of shoes available increases almost exponentially. There are even people who wear trainers as fashion footwear, with no intention of running or jogging anywhere. Not to mention those who collect trainers without wearing them at all.

Deliberately fragmenting the market is a potential strategy for competing against a cost leader. This strategy can sometimes allow smaller players to enter the market by targeting a single segment assuming that there is enough volume. This situation is discussed in more detail under competitive strategies in Chapter 6.

### 4.4.3 Difficulties of managing the PLC

There are some difficulties with the PLC in that it is not a precise science. For example, it is difficult to estimate how fast the market will grow or how long the maturity phase will last. It can also be a function of how good the organization is at developing new products and marketing. The extension strategies are often marketing-led, and if an organization is good at this activity, the product may have a long life, however, if the extension strategies do not work, the product may decline. Indeed, if it is thought that the product is about to enter the decline phase, and marketing activity is reduced or even stopped, the product will most likely decline. In other words, it can be a self-fulfilling prophesy.

**Learning activity.** See if you can think of examples of products that might be in the growth phase or the maturity phase of their product life cycle. Remember, it is not a precise science, so think of relatively new products and products that have been around for a long time. Can you think of any products that have declined?