

## IMPACTS OF SHORTENING PRODUCT LIFE CYCLE IN THE AUTOMOTIVE INDUSTRY

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### Abstract

The aim of this paper is to explain and describe the shortening of the life cycle in the automotive industry. The paper is focused on the analysis of life cycle model describing the different stages that are characteristics. Thanks to such a model can be better anticipate how will behave a product or service on the market. This article was briefly given to the effects that result in shortening of the life cycle and increasing the number of car models offered on the market.

**Key words:** product life cycle, innovation, automotive,

### INTRODUCTION

The automotive industry has undergone in the last few years, important socio-economic changes. There is no doubt that these changes have brought to the big global players, which are world-reputed car manufacturers, a number of benefits. The automotive industry is currently, respectively in the near future, faces due to new trends, new challenges that will have an important impact on the vitality of the individual automakers. The paper is focused on the phenomenon of shortening life cycle and the innovation cycle.

### PRODUCT LIFE CYCLE

Product life cycle is usually divided into five major phases or stages: development, market penetration, growth, product market saturation and subsequent decline [1,4,7]. These life-cycle stage really exist and can be used for different products or services.

The success of the product is defined basic equations [7]:

$$\text{Profit} = \text{total revenue from the product} - \text{the total cost of the product}$$

This profit is not uniform throughout the time course, is different at each stage of the product life cycle in the market. All phases of the product life cycle during the sale offer a variety of opportunities, challenges but also problems, therefore, each of these stages requires a different strategy for financing and marketing, other

manufacturing, purchasing and human resources to such problems could cope.

The typical life cycle according to another source includes investment phase, profit phase and decline phase, as can be seen in Figure 1. If a company wants to keep its product portfolio in the course they must constantly innovate and offer different versions of these products. Statistically it is proven that profitable and successful companies have many products with a long profit phase and shorter phase of investment and decline. Several effectively managed variables at each stage of life cycle can help to achieve a successful product. [4]

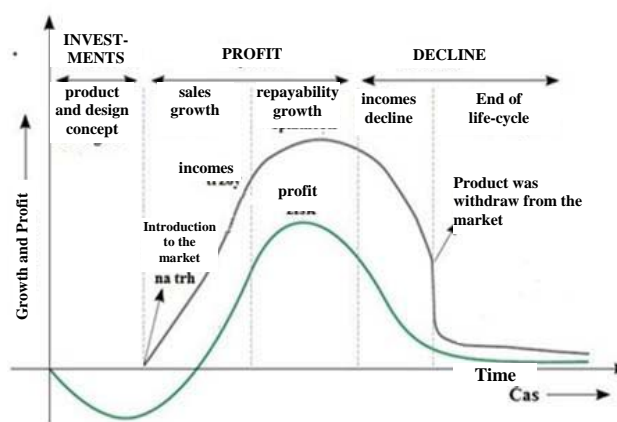


Fig 1: Product life cycle phases

### TIMING OF NEW MODEL INTRODUCTION

According to such model, the optimal situation for new product introduction could be defined as the one that [7]:

- Avoid cannibalization of the previous model.
- Compenstate the falling of old models sales.

Therefore, as far as timing and product life cycle curve are concerned, it is possible to expect the optimal introduction to appear a situation in which the new product life cycle compensate the old product life cycle keeping overall sales constant (Fig. 2).

High level demand constantly able to saturate the production capacity of carmakers plant is the most desirable situation. Although this theoretical standpoint does not take into account several aspect of operation management (for example, the fact plants saturation depends also from product mix, the possibility to separate demand trends and production operating in a make-to-stock logic), it underlies the idea of a necessary synchronicity between the old model sales performance of product life cycle policies according to a logic of sales regularities at a certain level.

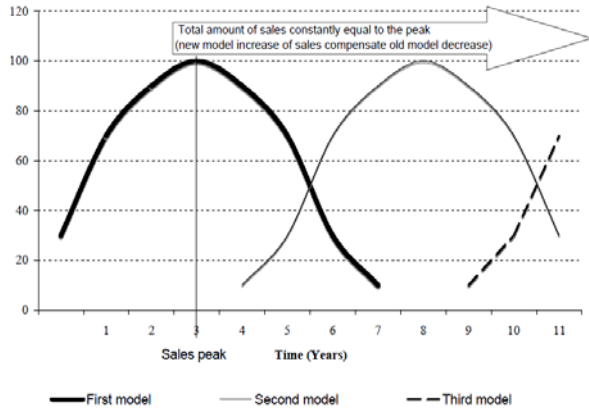


Fig. 2: Ideal timing of new model introduction [7]

**INCERASING OF PRODUCT VARIETY**

According to study Roland Berger [5] product variety has more than doubled in the past 15 years, product lifecycle have shortened by about 25%. As we can see on Fig.3 complexity has increased dramatically. Product variety more than doubled between 1997 and 2012, while the number of raw materials and components increased only to a lesser extent. The smaller rate of increase in raw materials and components is due to the standardization and modularization efforts of leading industries such as automotive.

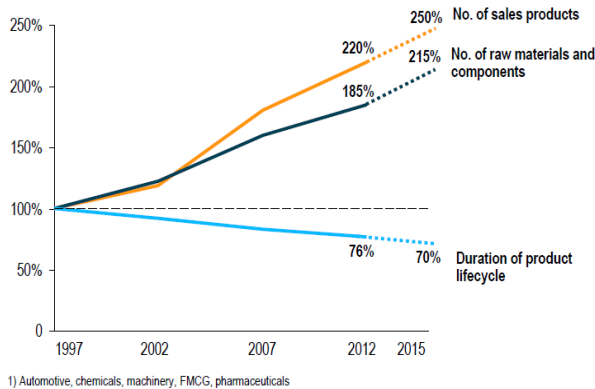


Fig.3: Increase of product variety across all industries [5]

The automotive industry started launching standardization and modularization efforts early on to fight increasing variety in raw materials and components. Machinery companies, on the other hand, started to optimize their product structure only in the past few years (Fig.4) [5].

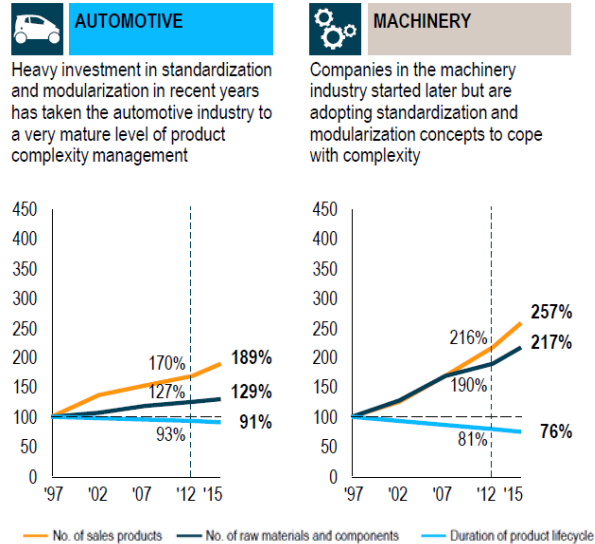


Fig.4: Increase of product variety in automotive and machinery industry [5]

**IMPACT OF LIFE-CYCLE TO INCREASING THE NUMBER OF CAR MODELS**

During the elapsed few decades, the number of independent automakers reduced by more than 50%, this resulted in the emergence of various group companies and business groups. The result of such concentration is greater diversity of model, which brings a very automaker. Such stabilization of automakers can bring a lot of opportunities, but also great risks, for example on maintenance costs.

One of the reasons for the increase in models offered in the market is more complex customer behaviour and the higher car demands. Nowadays the customer wants a car that was supposed to reflect his lifestyle, more and more automakers pass from mass to individual production. It is possible to observe on the part of customers and their increased demand for so-called. “niche” vehicles that are focused on a narrower group of customers (SUV, minivan). Today, the automaker can not be based only on the success of the design, and modern technology, but must have offered more different models. Also, the purchasing department is more difficult to handle organizing and coordinating the production of many brands and models and still be competitive.

**Shorter innovation cycles**

Lifetime of car models in the past decade in the more advanced countries decreased on average from 8 to almost 4 years. Also, the development time of a new model was shortened from 48 to about 25 months and in 2018 is expected to further reduce the level of 20 months.

In Figure 5 we can observe the time needed to develop a new model for the individual automakers and Figure 6 shows the reduction of car body development.

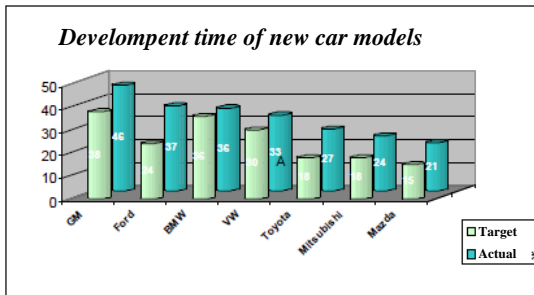


Fig.5: Development time of new car models

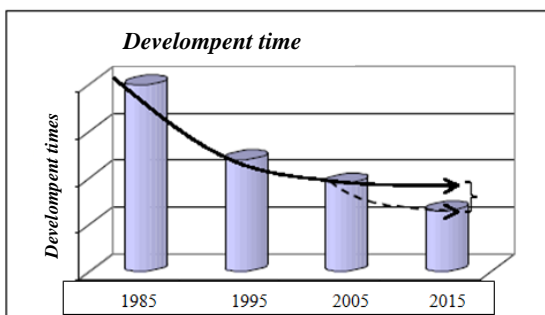


Fig 6: Development time of new car body

Examine the development of models and the resulting shortening of cars life cycle is a complicated process, because it is a wide effects that cause it and act on it.

Regarding the reduction of the product life cycle, namely automobile, a typical example is automobile Volkswagen Golf, which began production in 1974 and is produced today. It is now offered on the market his seventh generation. Until 2006, it has been sold more than 25 million units. [8]

The following table 1 shows the years in which each generation Golf was produced and how long they have been offered on the market. Furthermore, the table shows that during the 40 years, life cycle of Volkswagen Golf shortened from 10 years to three years, that is about one-third.

Tab.1: Development of model VW Golf

Generation	1	2	3	4	5	6	7
Production in years	1974-1984	1983-1991	1991-1999	1997-2003	2003-2009	2009-2012	From 2012
Years	10	8	8	6	6	3	-

**CONCLUSION**

The rate of innovation in the automotive market has increased significantly, and the VMs will have to face the challenge of responding to customer demand and competitors’ action in an ever more responsive fashion in the future, whilst

being constrained at the same time by much shorter sales windows and lower overall volumes per model to cover their costs.

Develop and launch vehicles within a shorter timeframe, as current product development times of 3+ years would not permit to compete in a market which innovates every 2-3 years.

Produce vehicles profitably at lower economies of scale. As the life cycle decreases and sales spread out over many models, the average volume per vehicle decreases sharply. Hence the breakeven point needs to be achieved much earlier on than previously. The common way of achieving this is to deploy a platform strategy, and the predicted average volume per platform shows this trend clearly.

Align the distribution strategy to the product variety offered, as a misalignment inevitably leads to high discounts needed to sell the vehicles. In effect a VM offering high variety would need to embrace a build-to-order strategy, whereas a low-complexity manufacturer might be able to utilise central vehicle stocks efficiently.

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**This article was created by implementation of the grant project VEGA no. 1/0102/11 Experimental methods and modeling techniques in-house manufacturing and non-manufacturing processes.**