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From Dieselgate to e-Vehicles. The new industrial commons in East-Central Europe

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Abstract

In 2015 the US Environmental Protection Agency (EPA) found disturbing data from many Volkswagen Group vehicles. The analyzed cars had a special device which controlled the vehicle's gas emission during the tests but after that it automatically shut down. After these news reports the trust disappeared away from the diesel-car industry. The former Comecon countries (Czech Republic, Hungary, Poland and Poland) had a difficult time after the Diesel incident, because their industry relied on vehicle manufacturing and exporting. In the same year the British vote about the European Union membership (so called „Brexit") also became a threat to the automobile industries around the world. The new global and European green polices also challenged the diesel-fuelled vehicles status in the automobile sector. Old competitors (petrol-fuelled cars) and new challengers (electric cars, hybrid cars, ethanol-fuelled cars) came into play as the market and the customers decide. According to the latest surveys the East-Central European Region ("Visegrad Countries") will have a dedicated place in the new "e-engine" production and in the accumulator production. These surveys also show, that the region will be the 2nd largest electric car accumulator producers by 2025. In my presentation I would like to show how outsourced technologies and methods can be settled down in other countries and what are the possible ways to improve them to a different economic scene.

Keywords: strategic management, car industry, economics, industrial commons, manufacturing, key competences, electric cars

1. Introduction

The aim of this paper is to present how outsourcing emerged as a common practice in production, and how it makes developing a coherent corporate strategy difficult.

The first structural unit of the study is a historical overview of the steps that ultimately led to the spread of outsourcing practices. This section does not specifically aims at providing an extensive overview of the transformation of the role of production since the industrial revolution, but rather demonstrating that the succession of rational, well-considered, logical steps has ultimately led to a practice that is against the best interest of a company itself.

The second major structural unit intends to demonstrate exactly why outsourcing production is against the company's interest. What are the main areas where this practice has such harmful consequences that it jeopardises the company's core business in the long term? I will argue that these main areas are innovation and strategic dynamism. However, the negative effects of outsourcing go beyond the company and endanger the entire industry within a particular geographic unit. When presenting this final thought, I will also highlight on why it is much more difficult to reverse this process than it was initiated.

In my view, the historical overview and addressing the issue of the negative consequences of outsourcing is essential for demonstrating that outsourcing is a tool that can actually help to cut the cost of a company, but commitment to it must be a strategic decision that goes far beyond a simple profitability analysis.

2. Historical Overview

The aim of this chapter is to show how the role of production in corporate strategy has evolved. In my study, the strategy, based on the views of Pisano (2015), is interpreted that it is a commitment to coherent, mutually strengthening methods and forms of behaviour that aim at achieving a particular competitive objective.

Alternatively, once a strategic goal has been identified, it is necessary to review each activities of the company to see whether they really help to achieve this goal. In case it is not confirmed, the activity concerned needs to be strictly reconsidered.

2.1. The Taylor paradigm

During the Industrial Revolution, the so-called Taylor paradigm emerged in production, resulting in the United States becoming a dominant industrial power by the 1920s. Since the strategy was clearly focusing on the product (Dawar, 2013), it was difficult to separate the production strategy from the strategy of the company, as it more or less defined it. If during this period the company's production strategy is interpreted as the strategy of the whole company, then, in my opinion, the Taylor paradigm is a coherent strategy according to Pisano (2015).

Its purpose was obviously to maximize profits through mass production. To this end, all production activities were restructured. The tasks were divided into small parts to perform tasks with a specialized tool so that it could be performed without being fully aware of the entire workflow. Skilled people were removed from physical work; their primary task was to organize production. One of the biggest drawbacks of mass production is that production would have stopped in case of any shortage, therefore, in order to make up for fluctuating supply, companies held large stocks of raw materials in that era. One of the key elements of the system was that holding large stocks and having a certain number of rejects in the production was considered inevitable (Hayes and Pisano, 1994).

2.2. Lean

In the 1950s Toyota developed its revolutionary production system, the Toyota Manufacturing System (Mishina and Takeda, 1992). Lean manufacturing (Hayes and Pisano, 1994) emerged from this system, which, in the 1970s, became a major competitor to the American industry which was essentially still based on the Taylor paradigm, and it challenged the basic idea of keeping large stocks of raw material and having a certain amount of rejects is inevitable.

The underlying idea of lean manufacturing, on the other

hand, is that waste is unacceptable. (Hayes and Pisano, 1994). Rejects, or unnecessary stocks or excessive amount of raw material of course, are considered such waste. In more detail, inventories or unnecessary movement of people between production lines, are also considered wasteful, thus this excess time has to be cut down. Specialized production tools are not desirable, as they are not utilised in all manufacturing processes. Untapped knowledge is also considered as waste, as a result, the general expertise of workers is much greater compared to the Taylor system, and communication is more direct.

In fact, the biggest advantage of Lean Manufacturing was that it boasted much greater operational efficiency. Porter (1996) defined operational efficiency as performing tasks *similar* to those of a competitor's *better*. Seeing the better results, companies in the United States set the goal of introducing the Japanese system into production often associated with daring development goals.

Investing in the development of production was a temporary competitive advantage, as competitors also introduced or copied these developments. Further improvements were limited by the fact that, as operational efficiency increased, it began to reach the technological constraints of the period. In the end, there was a need for a different approach and in the 1990s Porter's (1996) strategic positioning became the basis for competitive advantage.

2.3. Strategic Position

As technological constraints, especially in the United States, began to affect operational efficiency, the focus of corporate strategy inevitably shifted from further optimization of production to strategic positioning (Porter, 1996).

If operational efficiency means that a company performs tasks *similar* to those of a competitor's *better*, strategic positioning means that a company performs tasks *different* from its competitors. This means that, unlike operational efficiency, it does not try to do everything better than a competitor, but wants to create values in some other areas instead. This differentiation is the base for competitive advantage.

The goal of strategic positioning for a company therefore is to target a part of the entire population and satisfy the needs of this consumer group better than a fully-marketed product could satisfy it or better than a competitor's product satisfies it. The economic consideration behind this is that although there are fewer consumers in the narrower market who generated demand however, products that are tailored to their needs are more valued by them, thus higher prices can be charged. The higher price collected from fewer consumers may ultimately result in higher profits.

The age, gender, marital status, world view, geographical location, habits, disposable income or some combination of them can all be considered when a consumer group is created. Some further aspects can be easily found whereby the population can be divided into sections, but that is not the purpose of this study. The lesson to be learned is that mass market production was to target all consumers, lean manufacturing attempted to create a competitive edge by reducing cost structure, while strategic positioning aimed at targeting a certain part of the consumers to have competitive advantage.

This kind of strategic positioning increases the utility of consumers, on the one hand, and on the other hand it reduces competition between companies, as while they compete within an industry, they can be regarded as competing in a monopolistic position based on their own market position.

Accordingly, instead of focusing on the product orientation of the Taylor paradigm and or on efficiency like in lean manufacturing, the central issue of strategic positioning is which specific consumer group is targeted by the company, how to adjust all its activities to serve this consumer group's needs, how to strengthen this strategic position and protect it from potential competitors.

2.4. Dynamism

However, in the 2000s, strategic positioning was not enough. For example, Siebel Systems' strategy was built on targeting a narrow market segment in the software development market. At the time when the company was created, background office applications such as SAP or PeopleSoft emerged. While these programs primarily helped the company's financial, accounting, manufacturing organization and distribution tasks, Siebel Systems developed software specialised for sales, consumer information and marketing, and related software. (Simons - Dávila, 2013). This is a typically static strategy based on a strong strategic position, and Siebel performed well in the 1990s, reaching a revenue of $ 1 billion (Simons and Dávilla, 2013) in merely seven years.

Later, however, this static strategy could not respond efficiently to the rapidly changing market conditions. Since the 2000s, the company's profits had been steadily declining and despite its stable strategic position it collapsed in 2005, and its competitor, Oracle, acquired it.

Nowadays dynamic competition strategy and ability-based competition are decisive (Stalk, Evans and Shulman, 1992), which emphasizes the acquired abilities of the company rather than a firm strategic position. These capabilities enable the company to quickly change its strategic position even in a changing economic environment and to readjust its acquired capabilities to perform a new task.

Integrating goods into services (Sawhney, 2016) and the acquisition of companies closer to the consumer in the value chain, vertical integration, have become dominant strategies (Wise-Baumgartner, 1999). The main issue for companies was which customer needs they could serve rather than what else they could still sell (Dawar, 2013). Meanwhile, the strategic role of production has diminished.

3. The concept and use of industrial commons

3.1. The concept of industrial commos

Pisano and Shih (2012) refer to industrial commons as a critical mass of suppliers, customers, competitors, skilled labour, universities, and infrastructure that belong to the same industry and are situated in the same geographical area. While Porter (1993) mainly emphasized the competition between competitors, Pisano and Shih (2012) show the symbiotic relationship between economic and state actors within these industrial communities.

These commons are created due to the fact that the companies want to be close to their customers. This attracts their suppliers to them, as companies are customers at the suppliers' market and the suppliers also want to be close to their own customers. When a new competitor enters the market, the most logical step according to game-theory is to be situated in the proximity an existing competitor's supplier network, however, this network will be unable to supply for two companies. This will attract additional suppliers and skilled workforce to the region, and sooner or later the emerging universities and infrastructure will emerge to provide professionals to the industrial commons. It is evident, how this virtuous circle gains momentum.

An essential feature of industrial communities is that all economic operators benefit from their existence, for example by having more workforce available, their transfer

between firms allows knowledge to be spread, or due to the concentration of the supplier system, according to the five forces by Porter (2008 [1979]) competition is getting fiercer, which in turn will reduce the cost of raw materials for the company concerned and reduces the bargaining power of suppliers.

The process of evolution also shows how an industrial commons can disintegrate. An economic downturn or, for example, outsourcing may result in the stopping or even reversing the process above (Pisano - Shih, 2012). When companies quit or cease their activity, suppliers and skilled labour will move away. The declining labour supply and increasing bargaining power of suppliers will intensify competition within the industry concerned (Porter, 2008 [1979]). This can encourage companies to outsource their business or can make further companies go bankrupt. While the evolution of industrial commons is a virtuous circle, their evolution, is just the opposite: a vicious circle.

The evolution process described above is typical of Western Europe and the United States. According to Khanna (2014), distance, including cultural distance beyond geographical distance, makes it difficult to apply certain results, considerations and models. The emergence of industrial commons by Pisano and Shih (2012) is a concept not easy to interpret and apply in Eastern Europe, for example. In contrast to the above organic process of evolution, it is more common in this area that governments of individual nation states invest heavily in the establishment of business units outsourced from Western Europe and the United States.

4. Economic structure of Slovakia and Hungary – the automotive industry

Table 2. Distribution of Hungarian foreign trade in goods broken down by category, 2018 (HUF billion)

Main Export Categories	**Export**	**Percentage**	**Import**	**Percentage**
Food, drink, tobacco	2266.6	6.8%	1635.4	5.2%
Raw materials	751.8	2.3%	676.6	2.1%
Energy resources	943	2.8%	2589.9	8.2%
Finished products	10830.3	32.4%	11656.3	36.8%
Motor vehicles, means of transport	18617.4	55.7%	15098.4	47.7%%
Total	33409.1	100.0%	31656.7	100.0%

Source: CSO (2019)

Table 2 shows the volume of Hungary's product exports, in billion forints, in 2018, and their share of total exports in percentage. It is evident by the table that vehicles and transport vehicles occupied a prominent position in foreign trade in 2018. In fact, this category accounted for more than half (55.7%) of Hungary's exports and nearly half (47.7%) of its imports. Vehicle manufacturing has been the number one engine of industrial production since 2011, with the exception of the period of the economic downturn, and has been growing ever since. The reason for this is that this sector is essentially export-oriented, which has ensured constant demand for the products manufactured (KSH 2019).

The data of the Central Statistical Office are supported by the GlobalEdge (2019) collection, which reveals that three of the five leading Hungarian export products, boasting with the highest turnover, are closely related to the automotive industry.

Table 3 Export Volumes of Hungary in 2017 (USD)

Product	Volume
Electronic machine	23,062,394,486
Industrial machine	20,709,378,491
Motor vehicle and parts	19,292,912,934
A pharmaceutical Products	5,209,103,575
Plastic goods	4,365,179,353

Source: GlobalEdge (2019a)

Four of the first five major export products account for over $ 60 billion, which is more than half of Hungary's total exports, belong here. Not surprisingly, according to GlobalEdge (2019b) statistics, Hungary is ranked 28th among the exporting countries, which is a prestigious position.

Table 4 Volumes of products exported by Slovakia in 2017 (USD)

Product	Volume (USD)
Motor vehicle and parts	22 563 634.386
Electronic machine	17 514 454 552
Industrial machine	10 323 800 063
Iron and steel	3 951 279 224
Mineral and mineral oil	3 809 857 567

Source: GlobalEdge (2019b)

Table 5. Hungarian and Slovak car production (2018).

	Passenger cars (pieces)	Total (pieces)
Hungary	472,107	472,107
Slovakia	949,365	949,365
European Union	16,957,230	19588909

Source: ACEA 2018. Edited by the author himself.

Table 5 clearly shows that automotive-industry cooperation between the two neighbouring countries can be fruitful for both parties in the future. Considering the volumes, it can be seen that the Slovak automotive industry produces twice as much as its Hungarian counterpart and is thus they are considered competitors in terms of economic competition. The car production of the two countries accounts for almost 8% of the total EU production, which is significant compared to the countries' regional and population data.

After the change of regime, several car factories were established in Hungary. They include Opel (Szentgotthárd) and Suzuki (Esztergom). They were followed by Audi (Győr), Mercedes-Benz (Kecskemét) and most recently BMW (Debrecen). The number of factories suggest that Hungary has become favourable for the automotive industry, as a serious system of suppliers has been established over the years. This began the process of the development of industrial commons, which later became a self-accelerating, productive process.

In view of this, it may be appropriate to study the Hungarian automotive industrial commons, as this has the greatest impact on the country's economic performance and is the basis of Hungary's positive foreign trade balance.

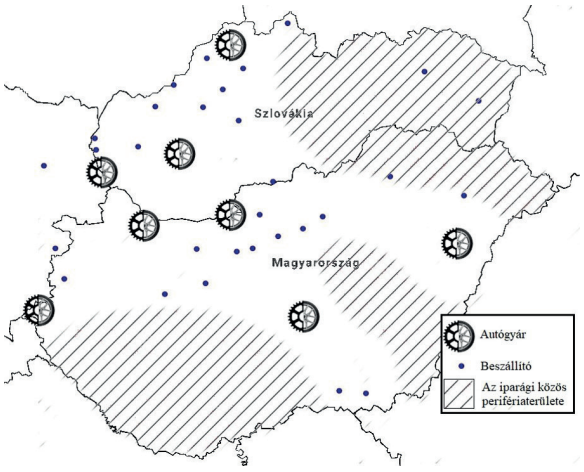


Figure 2. The industrial common of Hungary's and Slovakia's automotive industry and its peripheral area

Source: Edited by the authorhimself based on data by Invest in Austria (2018), Slovak Investment and Trade Development Agency (2018) and Hungarian Investment Promotion Agency (2012)

Figure 2 shows the Hungarian and Slovakian automotive industry commons. Pisano and Shih (2012) point out that industrial commons often disregard national borders and intertwine through them. Ghemawat (2013) generally states that there are factors that influence the intensity of trade between two countries. There are several factors that make trade between Slovakia and Hungary more difficult - the lack of a common currency, the lack of a common language - while many factors have a positive impact on it, such as belonging to a common economic bloc or the simple fact that the two countries border one another. All of these factors mean that Slovakia is an important export destination for Hungary, and vice versa. The two industrial commons are thus intertwined.

Figure X is also suitable to illustrate the difference between an industrial common and an industrialized zone. Areas of high industrial concentration include those left out of the automotive industry, and there are places which, despite the lack of industrial concentration, are involved in the supply chain as a supplier. Typical examples are suppliers in South Hungary or East Slovakia.

5. Automobile industry in Europe

	Passenger Car	Light commercial vehicles up to 3.5t	Medium commercial vehicles from 3.5t to 15t	Heavy commercial vehicles over 15t (incl. buses)	Total
Czech Republic	1,345,031		61	744	1,345,846
Hungary	430,988				430,988
Poland	451,600	180,058		15,650	653,700
Slovakia	1,031,241				1,031,241
European Union	16,540,052	2,127,857	110,130	427,056	19,205,095
Visegrad countries	3,350,053	161,055	6,112	13,974	3,531,194
V4 / EU (%)	**20%**	8%	0%	4%	**18%**

Source: ACEA

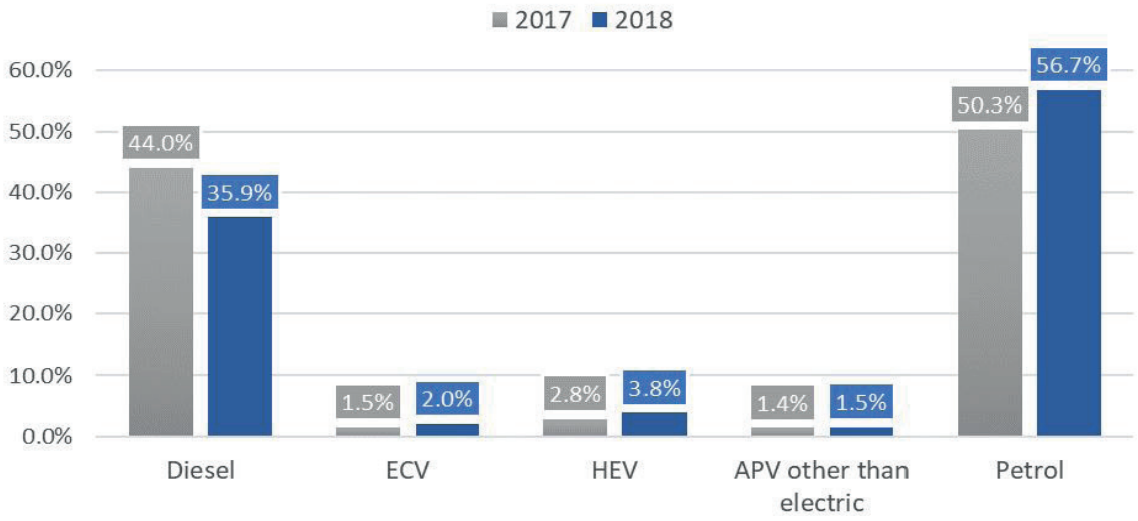
The analysis of the statistics released by ACEA reveals how many cars have been manufactured in the European Union this year. The figures show that the EU itself have produced nearly 20 million (19.2 million) vehicles this year, of which the Visegrad countries contributed actively. In terms of passenger cars, V4 countries accounted for 20% of EU production, so every fifth car came from here. Looking at the other categories, it can be seen that, of the V4 countries, only Poland was able to achieve significant results in the category of light and heavy commercial vehicles. It is also interesting that compared to the sizes of the countries concerned, the Czech and Slovakian car production is several times higher than the Hungarian average, therefore there is still room for improvement for the Hungarian market.

6. Volkswagen Emission scandal (2015)

In 2015, the US Environmental Protection Agency became aware of the fact that an unidentified device was repeatedly found in vehicles belonging to the Volkswagen group. Subsequent investigations confirmed the agency's suspicion that a device hidden in Volkswagen cars could reduce the emission during the relevant tests then restored it to its original value at the end of the test. The event, often referred to as the Dieselgate (or emissions scandal), received huge political, economic and media coverage, which soon made further waves. It turned out that there were several other companies that were unable to meet the stringent standards, and others (including PSA) were involved in similar scandals.

Due to news regarding various companies, market transformation has begun, which has been clearly palpable in the diesel car market. The following figure illustrates this trend.

New Passenger cars (2017-2018)



Source:

According some platforms market changes were triggered by green ideas as well as environmental concerns, however, a closer look reveals that this has not always been the case. STATISTICS shows that around 2017-2018 the waves of the crisis were still having a strong impact on the market. Along with the decline in diesel vehicle sales, it can be noted that differently powered vehicles (EPV, HEV, APV) have appeared on the market. However, the STATISTICS published clearly show the ambivalent nature of market transformation.

7. The impact of the emission scandal

As we have seen, the diesel scandal has transformed the car manufacturing market in several ways. One of the most important of them was the decline in sales of diesel-powered cars and the increase in sales of vehicles powered by other means (electric, gas, hybrid). However, statistics reveal the controversies of experts explain the phenomenon by environmental concerns, as the "profit" loss affecting diesel cars was beneficial for not only vehicles powered by alternative means, but the sales of petrol cars and trucks has also increased. This is due to a combination of factors which I intend to explore later on.

7.1 Number of new models (e-models)

The diesel scandal has triggered the transformation of the car market. Most attention has been given to cars with different alternative propulsion (ECV: electrically charged cars; HEV: hybrid electric vehicles, APV: alternatively powered vehicles), but the ACEA measurement reveals the controversy caused by the scandal. Instead of diesel cars, the number of petrol-driven vehicles has increased, which is based on the market's short-term response to emerging concerns. The electric car market has not been able to provide an immediate alternative to the European anti-diesel hysteria that can only be solved in the medium term. Experts tend to explain the market's decision with the lack of two main factors: on the one hand, the few car types available and, on the other hand, the service sector (charging station, service) still have major shortcomings.

7.2 New Battery factories

However, there may be important changes in the market for alternative-fuelled cars in terms of production. Responding to the diesel scandal, the relevant bodies of the European Union have decided to take steps towards economic transformation. Documents issued by the European Commission state that global demand for batteries is becoming a strategic issue as it is predicted to generate as much as € 250 billion per year from 2025 (COM 2019). That is why the European Commission has taken steps and made decisions to classify batteries as a strategic value chain. The document establishes that the Union is strategically lagging behind its competitors (especially behind Asia): while Europe has a share of 3%, Asia boasts 85%. This challenging situation is due to not only the lack of production, but also the lack of raw materials (lithium, nickel, cobalt, manganese, graphite), as most of them are in Chinese hands. (COM 2019). Therefore, the EU must strive to establish economic relations with countries that possess such metals and to assess the continent's supply of raw materials. Further development requires not only geological tasks to be completed but also serious research and development, be it basic research or methods applied. In order to create the workforce needed for this, it seems necessary to combine European (EU) resources and private sector capital to finance new developments. the circular economy of battery production is considered a priority by European decision makers, i.e. the issue of secondary utilization of existing and newly developed devices. (COM 2019). An important stipulation of the document is that the leaders of the Union should support those efforts that are interested in such development of the industry, be them are national or transnational initiations.

According to a report by Transport & Environment (2019), the European Union will have to be self-sufficient in the production of Li-Ion batteries by 2025, which will require the establishment of several plants. Four of the 11 factories planned are located in the region, including three within the territory of Hungary. German-based Siemens is operating in Göd, while the South Korean SK Innovation (SKI) in Komárom wants to establish two plants. The new facilities do not fit into the EU production chain presented above yet because they rely on foreign companies, in other words, it is not Hungarian economy that provides the intellectual background for it. In the long run, the investment projects performed in the territory of Hungary and the development of R&D in Hungary can contribute to the pan-European (EU) production cycle as the country will be the owner of "Southeast Asian" know-how. And based on the example of the establishment of Audi, it is evident that Hungary has the research, development, education and labour-market

factors that make it suitable for the establishment industrial commons with such long history.

7.3 Electric chargers

In addition to the expanding market and supply, car charging stations have appeared in more and more places. A collection of available stations has been compiled by the OpenCharger website; the details of it are shown below.

Charging stations worldwide (locations and numbers)

Country	Chargers (number)	Locations
United States	34953	21813
Germany	29865	12141
Hungary	1012	522
Czech Republic	562	439
Poland	556	304
Slovakia	252	190

Source: OpenChargerMap (2019)

Taking a closer look at the data of the Visegrád countries, it is evident that it is Hungary that currently has the most of these stations and locations, however, there are still parts of the country where no such infrastructure is not available. The disputes between the systems, as we have seen, raise the possibility of further expansion, as the energy transfer of cars also needs to be solved at some level. The advantage of PlugIn vehicles is that unused electricity can be recycled back into the system by the owners, creating a constant "cycle" thereby. The volume of charging stations available in the United States greater by several magnitudes than those of the Visegrád countries, due both to the size of the country (including almost a continent) and its industrial development. Calculated in this way, one can see the industrial and technological performance behind the data measured in Germany, which the country has achieved over the years. As it was seen earlier, most of the electric cars will be provided by the German-based Volkswagen group in the near future (according to predictions), so the two developments may be related to one another.

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