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Knowledge management and leadership: the carbon emissions scandal in the automobile industry

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Abstract:

This paper analyses the Volkswagen scandal from a KM point of view. We use a KM framework of analysis basing ourselves in the concept of Knowledge failures. We describe the VW case of management and then analyse it from the point of view of KM. We conclude that in the VW case on carbon emissions a massive operation of KM existed, that some consider to be a success, despite the consequences, and others see as a failure. We discuss the conditions that allowed it to happen and how to prevent it in the future. We also discuss the implications of the scandal to the societies it involves and in particularly to the Economies of Central Europe.

Keywords: Knowledge failures; carbon emission scandals; Volkswagen; Central Europe
JEL codes: F64, D83

1. INTRODUCTION

If there is a good that represents the affluent societies of the 20th century, it is the automobile. Cars represented for long social status and economic development as well. Henry Ford coupled with Frederick Taylor to signify the Second Industrial Revolution, powered by oil. Limousines and Rolls Royce's were the features of business men and leaders. Developed countries were made around brands like Ford, Fiat, Renault, Volkswagen, and British Leyland. The emergence of Japan was also defined by the raise of Toyota and Toyotism. The Ladas encapsulated the failure of the Eastern European countries, and the non-existence of automobile brands in the underdeveloped world was a basic feature of their underdevelopment. When India began to emerge Tata saw the light of the day and China's economic development occurred when bicycles replaced automobiles in many households.

There have always been exceptions. Einstein famously rode a bike, and the first big warning about the perils of the automobile industry to the global economy came with the Meadows Report in 1972 – the economic system would be doomed if we continued to rely on oil, and cars were a part of the problem. Since the eighties, smaller cars whose consumption rate per 100kms were much

less like Honda Civic invaded the market, limiting the effect of the increase in the oil prices following 1973 and 1979 crashes.

Finally in the year 2000 evidence was put forward that carbon emissions due to automobiles were badly damaging the environment causing a ozone hole which might have devastating effects in the world economy. Agreements were made and signed by Governments, which created responsibilities for companies and organizations in order to introduce in the automobile industry devices that would reduce those emissions and effectively save the planet. If was in those years that Corporate Social Responsibility coupled with Sustainability became major world concerns, some would say paramount facets of the ideology of political correctness which prevailed in the world in the first decade of the 21st century.

In 2015 some encouraging news emerged, first with the data that showed a reduction in the ozone hole, and second with the singing of the Paris agreement by 150 countries including the biggest polluters, like the USA, China, Russia and the European Union.

Another very important transformation that occurred in the last 50 years was the emergence of a Knowledge based and service led economy. After WWII Human Resources had become the focus of much investment in advanced societies so that Human Capital was seen as the counterpart of financial capital and physical capital to generate private success and social prosperity. But with the Third Industrial Revolution Knowledge Management and Intellectual Capital became two major fields of analysis, along HRM and HRD. The question was not only anymore - How to develop competent people? but also, How to manage these people knowledge? and also How to use those new forms of capital strategically?. The various types of models in fact deal with intangibles, IC being the sum of human, internal and external capital, and the explanatory factor of the difference between market value and book value. All those analysis have dynamic aspects, and relate to technology, people and processes. Even with the financial crisis of 2007-8, which may be considered a product of knowledge failures these basic ideas and theoretical background were not affected, because indeed, they are very much grounded in society.

However rather shockingly during 2015 and 2016 the world economy was shaken by the surprising revelations concerning the control of emissions in fuel automobiles, starting with the case of Volkswagen and rapidly reaching many of the main European car companies. Suddenly it became clear that for years one of the most trusted car companies in the world had been cheating the regulators and by consequence the costumers and profiting enormously out of it.

Analysis have been made on the VW scandal, above all from a newspaper point of view, searching for conspiracy theories and for “who-did-it” situations, looking for criminals and discussing potential geostrategic implications.

However in the context of a knowledge economy that we just described above, we strongly believe that the case of Volkswagen should be analysed from, a KM point of view. Following Bratianu 2015 and the analysis of the Space shuttle disaster as a knowledge failure in this paper we analyse the VW scandal from a KM point of view, that one being the research question.

For so doing the remaining of paper is divided in six parts. In part one we present the theoretical background. In part two we describe both Volkswagen and the Carbon emissions scandals. In third part we analyse the carbon scandal from a KM point of view. In part four we discus implication of the scandal for KM theories. In part five we analyse the implications of the scandal for the economies it relates too and in particular to the economies of central Europe, and in part six we present the paper's conclusions, and suggests ideas to do further research.

2. LITERATURE REVIEW

KM is a well-developed area of research. Seminal works include reflections on tacit and explicit knowledge (Polanyi, 1963), definition of the Knowledge cycle and the associate "Ba" concept of dialogue (Nonaka and Takeuchi, 1994), definition of knowledge worker and knowledge company (Drucker, 1964), definition of knowledge city and knowledge region (Edvinson and Bonfour, 2004). Other very important studies relate to knowledge dynamics (Kianto, 2008; Schiuma, 2011) unlearning (Moya and Cegarra, 2004) and to the stages of KM history (Edwards, 2011).

Most of the literature focuses on how getting the best from scarce resources, and on how to improve the use of those scarce resources. There is an urgency to define best practices and ideal frameworks of action.

More specifically, and regarding the scope of this paper KM has been analysed in relation to the automobile sector. Topics analysed covered product development (Aoshima, 2002), the technical capabilities (Rajadhyaksha, 2005), knowledge creation (Pillania, 2008). product performance (Laksman and al, 2008), operations management (Taylor and Taylor, 2008), transfer of knowledge (Gentile-Lüdecke. and Giroud, 2012) balance scorecards (Hassan, 2012), strategy (Moore, 2012), action learning (Strategic Direction, 2013), knowledge sourcing and reuse (Filieri, and Alguezaui, 2015), critical success factors (Karami and al, 2015), innovation and knowledge policy (Macneil and Hughes, 2016), and green innovation (Leal Milan and al, 2016),

The analysis related to countries so different as Brazil (Laksman and al, 2008), Germany (Moore, 2012), India ((Rajadhyaksha, 2005, Pillania, 2008), Iran (Hassan and al, 2012, Karami and al, 2015), Italy (Filieri, and Alguezaui, 2015), Japan (Aoshima, 2002), Taylor and Taylor, 2008), Poland (Gentile-Lüdecke. and Giroud, 2012), Spain (Strategic Direction, 2013, Leal Milan and al 2016), and the UK (Moore, 2012, Macneil and Hughes, 2016).

The analysis was essentially concerned with cost effectiveness and creating order (Aoshima, 2002, Rajadhyaksha, 2005, Laksman and al, 2008, Taylor and Taylor, 2008, Hassan, 2012, Moore, 2012, or Karami and al, 2015) or managing knowledge by addressing chaos (Pillania, 2008, Gentile-Lüdecke. and Giroud, 2012, Filieri, and Alguezaui, 2015, Strategic Direction, 2013, Macneil and Hughes, 2016, and Leal Milan and al, 2016). All those analysis were centred in success – how to achieve it and how to replicate it.

However in the last years attention began to the paid to failures in the management of Knowledge (Sterrey and Barmet 2000). Those failures have been described

in terms of organizational characteristics that make them possible (Weber, 2005). Well known characteristics of Japanese organizations, previously held to be the foundations of innovation, change and flexibility, were found equally be significant barriers to change, innovation and adaptation in turbulent economic environments (Collinson and Wilson, 2006). More recently, one study highlighted the importance of anonymity while sharing the experience of failures (Huerta and al, 2012). Furthermore, unexpected accidents are found to be a form of Knowledge failure that should be prevented (Paltrinieri and al, 2012). Muehlfeld and al, 2012, found that the degree of stimulation to deliberate learning was important to learn from failures in acquisition processes which occurred in the newspaper industry. Other study centred in analysis of possibility of failures and its effects by interviewing experts (Lou and Lee, 2014). Moreover, failures were also considered important in New Product Development (NPD) (Yu and al, 2014). Finally, Cecez-Kecmanovic and al, 2014 analysed failure in Information Systems as a failure in relational processes described by sociomaterial practices; namely, "*the IS project and the implemented system as objects of assessment are not given and fixed, but are performed by the agencies of assessment together with the assessment outcomes of success and failure*".

KM has also been linked with corporate social responsibility in theoretical terms by enhancing processes (Preuss, Córdoba-Pachon, 2009), but also regarding countries like Australia (Wailes, and Michelson, 2008) and Vietnam (Hi and Nguyen, 2016). Lately the theory was revised and adjourned to include the notions of KM for sustainable development (Siltaoja, 2014) and also green intellectual capital (Chang and Chen, 2014).

Finally KM has been found to be a force of knowledge development by enhancing competitive advantage of those regions (Tallman and al, 2004), by creating smart cities (Angelidou, 2015) and also by generating knowledge based coalitions between regions (Roos, 2014; Schebesch and al, 2014; Cabrita and Cabrita, 2010).

All those theories and previous analysis provide the background to the analysis that will follow about the VW case. Namely it is evident from the literature:

1. Knowledge and KM have a decisive impact in organizations, nowadays.
2. Knowledge failures exist and are related to information failures and processes which go awfully wrong.
3. KM is a factor of CSR and sustainability.
4. KM is a factor of regional development by the operation of clusters, knowledge cities and coalitions.

These four main ideas will base the remaining part of the paper.

3. THE VOLKSWAGEN CASE AND THE CARBON EMISSIONS

A winning company

Volkswagen company was created in the 1937, and after WWII became one of the most important car companies in the world and one of the most important companies in Europe. Volkswagen brand image was related with the idea of being a "car

for the people" so basically middle class and working class, by opposition with some other companies that produced cars that were seen as signs of affluence like Rolls Royce or the American cars. VW was meant to be made in western democracies unlike the Ladas from the Eastern block of Europe and was meant to be cheap, reliable and resistant. It also should be attractive visually and in the sixties the "Beetle" car was the synonym of that features, giving VW an almost unique status. Those popular characteristics were responsible for the fact that VW resisted rather well to the disturbing events that took place in the automobile industry during the seventies and the eighties and that were consequence of the rise in oil prices and the increased competition from Japanese companies.

In the nineties and the first fifteen years of this century the branding of VW and of the automobile industry became increasingly more related with sustainability, green and social responsibility issues. Cars should be safe, spend the less oil possible, send to the atmosphere the less carbon emissions – and this should continue to be made with cheap vehicles, even if the living standards and disposable income of the potential costumer in the last decade has been much higher than the one of the costumer in the sixties. An interesting way of analysing that change was to compare the Beetle version of the nineties with the version of the sixties – more technological, more aero-dynamic and also more expensive, and with less social impact.

In 2015 the automobile industry is an oligopoly of big companies located essentially in Europe, Japan, the USA and India. Those companies are have billions of market value, are hugely profitable and employ millions of workers. Also those companies seem to be in fierce competition every year issuing new amazing models that are promoted in fabulous fairs and with highly developed and expensive marketing strategies.

Of course the automobile industry as described has been the object of papers on the Knowledge Management field (Pillania, 2008, Gentile-Lüdecke. and Giroud, 2012, Filieri, and Alguezaui, 2015, Strategic Direction, 2013, Macneil and Hughes, 2016, and Leal Milan and al, 2016), and also from a more strategic point of view in the Intellectual Capital field (Aoshima, 2002, Rajadhyaksha, 2005, Laksman and al, 2008, Taylor and Taylor, 2008, Hassan, 2012, Moore, 2012, or Karami and al, 2015).

The unexpected scandal

It was in this context of prosperity, which occurred even considering the last not so good years in the European economy, that suddenly in September 2015 the world heard that the German company had for years concealed the fact that the cars were sending to the atmosphere a much higher amount of emissions than it was declared and expected (Holten, 2015). The situation had been detected by the United States Environmental Protection Agency (EPA). Cars met standards during regulatory testing but emitted up to 40 times more carbon in real-world driving. Afterwards if was found that already in 2011 the European Commission Joint Research Centre new that Volkswagen was emitting more gas than it was expected and a warning was given in 2013. The company first reaction was to say that only technicalities were responsible for what happened but then the company acknowledged it had "screwed up". Up to 11 million cars could be affected and most of them had to be

recalled. In October 2015 and for the first time in 15 years VW had a negative results in a quarter. Shares dumped. The CEO resigned. And Chancellor Angela Merkel showed concern about the company urging transparency.

More amazingly even, suddenly in 2016 it became apparent the other major companies had also cheated – the Mitsubishi president stepped down in May 2016 (Top Gear 2016) because if was found the company had been wrongdoing since 1991. Other similar situations occurred in Suzuki and Renault until now it seems in a lesser scale. At time of writing (November 2016) the expected amount of losses for VW derived from the scandal is at least of 14.7 billions, imposed by the American courts (Atieh, 2016). These are however the direct costs. To them, one must add the loss in sales, the damage to reputation and the reduction of activity. As a consequence the company just announced the dismissal of 30 000 workers, in the next few months (Riley, 2016). Significantly, the rally division, which was crowned world champion, will cease its operations in December and will not be competing in 2017 (Lauraux, 2016). Macro-economically the crisis adds to the owes of the German economy: even if the current surplus surpasses the limits admitted by the EU regulations (Mitchell, 2015), Deutsche Bank has problems with its earnings ratio, which are accrued by the Volkswagen scandal, and led already to a fall in the share value of around 50 per cent (Bird, 2016).

The scandal was already the topic of academic works, based on the fraud itself (Patra, 2016), or on Corporate governance (Rhodes, 2016).

4. THE VW CASE FROM A POINT OF VIEW OF KM

The VW scandal occurred because technical deceit existed and was concealed. The technical device was designed and implemented during years. Consumers and regulators were misinformed and cheated.

In fact KM occurred, although in a malicious and erroneous way at the various stages of the:

a) The device was created;
b) The device was implemented;
c) No information was given about the device's use;
d) Eleven million cars were sold with the device and nobody new;
e) Reports were made in the suggestion of compliance with laws and promotion of CSR and Sustainability values which were false;
f) Profits were made in a false basis;
g) The company made its name and reputation as being efficient and the device exposed cheating as a basis to that efficiency.
h) Even if it is not completely clear "Who knew what ?" in the company, it all ended in a massive case of fraud and failure of governance.

Therefore, this scandal should be considered as a massive operation of information and knowledge management with highest implications. We may analyse the scandal according to the various phases of the knowledge cycle or according to the SECI model.

The knowledge cycle:

a) Creation: Knowledge was created when the device was set, and whenever data that derived from the consequences of that installation were generated.
b) Sharing: VW being a big multinational the wrong data were profusely disseminated in the world, as also were all the financial and economic consequences and the data they also implied.
c) Stocking: Wrong data about the efficiency of VW and data on the company's operations based on the false basis were stocked in vast knowledge basis in the VWs' headquarters and subsidiaries.
d) Renewal: each year the dimension of the fraud was accrued and not even some news that the authorities new about what was happening as early as in 2011 made the alarm bell ring; in fact VW seemed to trust that nobody in the political world wanted to make public that he / she knew what was happening; this fact led to the "conspiracy theories" according to which issue was raised by the Americans in order to defend the ailing automobile industry from its German counterparts.
e) Unlearning: this seems to be the current situation, in which because of the American Court ruling, everyone involved from company workers, buyers, sellers, government agencies, shareholders and other stakeholders have to come to their senses and understand that reality was not what it seemed to be and it is necessary to unlearn the reality based in the false date and learn a harsher but more correct one.

The SECI model:

a) Socialization – discussions, meetings and brainstorms, happened between people who believed they were using, selling and buying a very performative and clean car.
b) Externalization – tacit knowledge acquired with wrong basis was made explicit by the writing of reports of memories.
c) Combination – reports were made combining several types of false data generated by the devices.
d) Internalization – ideas read or heard about the fake reality created by the device was incorporated in the discourse and minds of millions of individuals who, for more than a decade believed they were buying a non-polluting car when in fact they weren't.

In a word: the scandal was rooted on KM and survived because of it. The device was only implemented to generate misleading information and to create wrong or deceptive knowledge.

5. DISCUSSION

There are at least three ways regarding which the scandal is currently debated, namely as a failure or a success, as a symptom of capitalism and as a show of power. We will analyse those different aspects in succession.

Knowledge failure?

It is easy to agree that the VW scandal was based in information and knowledge management. But it is not consensual if the VW scandal constituted a knowledge failure. There are at least to ways of analysing the situation, and each one arrives at a different conclusion.

According to a more justice prone view of the scandal, the device was indeed a knowledge failure because it led to mistakes and in the end caused massive disruption, whose effects are yet to be seen in their totality, and that may end up affecting the position of Germany economy in the European Union and in the world, causing massive damage to its people and the their neighbours, like the Central European countries. The authors of this paper tend to agree with this version of the facts.

But, while writing the paper, and after presenting a draft version of it in a Conference, we found out that there is a very different and alternative version of the crisis. According to this second version, that we will call, in inverted commas, the "perverse version" there was no knowledge failure whatsoever, because for more than a decade the device effectively generated massive profits, earnings, wages, dividends and jobs, and now we are only witnessing a small reflux when compared with the big business that was generated by the device in more than 10 years.

Modern capitalism?

That the situation lasted more than 10 years, in age of globalized information should draw our attention about how oligopolies work. The automobile industry is an oligopoly and for more than 10 years players decided to hide their game believing nobody would find out. The VW scandal and also the scandals in other companies should be studied from the point of view of game theory and cartels. The economic theory says cartels put the economy away from efficient and fair solutions; indeed it seems that this time the cartel worked to fool consumers and the state by generating wrong information and misleading knowledge.

Also, the scandal not only about one emblematic company but about capitalism in the new age of sustainability and corporate responsibility and after the fall of the Berlin Wall in 1991. Karl Marx would be probably amused hearing about the ways major companies foul the State in order to make profits nowadays. As usual is seems that new is old and that the VW scandal is only the 21st socially responsible, green, sustainable and clean face of the lawless capitalism Marx fought in the 19th century.

Leadership and power?

Finally the scandal has clear implications and ramifications on leadership. The scandal could only happen because CEOs were not informed or if they knew about the situation, they in fact depended on the engineers to create and implant the device, and this speaks volumes about who really has the power in the companies of the 21st century (Tomé 2005). This means that our century company owners are dependent on creators (who in fact are the best, most valuable and less numerous

knowledge workers) who in fact are the most powerful persons in the new knowledge economy (Tome, 2012, Tomé and Remenyi, 2017).

6. THE CENTRAL EUROPE CASE

The VW scandal will have major repercussions in Germany.

But second to the home country there is good reasons to believe that the Central European countries will be the most affected. Namely:

1. First of all, VW has important factories in many Central European countries like Poland, Slovakia, Hungary, the Czech Republic and Bosnia-Herzegovina. The closing of a plant in any of these countries would represent a problem with probable massive bad consequences.
2. Secondly, in Central European countries consumers are used to by VWs at comparatively accessible prices, and the scandal will probably use the effect of rising the prices of the German cars.
3. Thirdly, Central European countries have extremely dense economic ties with Germany, and Germany is among the first trading partners of those countries. And the same happens regarding tourism, and foreign investment. Therefore if the worst case scenario will happen, the VW scandal will have repercussions in Germany via Deustche Bank, causing if not a recession at least a slowdown in the German economy. In this case, all the Central European countries will be affected, and the effect will be worse the more connected the country is with Germany. Additionally small countries would tend to be more affected than larger ones because it is easier for Germany to be relatively more important as a partner is a smaller neighbour like Slovakia than in a large one as Poland.
4. Continuing in the worst case scenario the scandal may have a knock out effect in the Central Europe because VW represented like no other brand the reliability and availability of the goods and services. The fact that the brand might be considered corrupt or at least prone to corruption and fraud, would be very damaging to the image of all the economic space that uses VW as an emblem.

7. CONCLUSIONS

The VW emission scandal was the biggest fraud known to date in the corporate world of advanced economies. That is lasted so long and that it had ramifications in other concurrent companies describes as may be no other fact the capitalism of the first decades of the 21st century. A world in which knowledge and information are the decisive assets, which are used for profits by corporations even if they postulate obeying and believing in major ideas like corporate social responsibility and sustainability. The full consequences of the fraud are yet to be known, but it is well understood that we are dealing with a long string of deceit and misinformation, which lasted for years, and had enormous consequences, first keeping the companies going and now with the backlash. There is a debate about the extent of the knowledge failure and the authors of this paper tend to consider that indeed the deceit was a failure of correctness that generated a scandal when discovered. Anyway there is a consensus

about the fact that the scandal was about knowledge, information and ultimately knowledge (mis)management. Finally, as usual in these cases, in which corporations or banks act riskly, the society is the ultimate underwriter (Sveiby, 2013); and it is in this context that the scandal can still be a problem for Central European economies in the near future.

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