

ISSUE OF ONLINE REPUTATION OF ELECTRIC VEHICLES - SELECTED VIEWS AND PERSPECTIVES

FRANTIŠEK POLLÁK, PETER MARKOVIČ,
RÓBERT VILÁGI & MICHAL KONEČNÝ

University of Economics in Bratislava, Faculty of Business Management, Bratislava, Slovakia.

E-mail: frantisek.pollak@euba.sk, peter.markovic@euba.sk, robert.vilagi@euba.sk, michal.konecny@euba.sk

Abstract Accelerated digitization significantly changed the usual procedures of marketing communication. With the goal of better customer targeting, companies are shortening communication channels, digital ecosystems are becoming a place where supply and demand meet. These facts are a source of opportunities, but also a generator of threats. The aim of the study is to provide an analytical view of the issue of managing the online reputation of selected manufacturers of electric vehicles, whose products represent a synthesis of innovation and necessity. The results of the analysis suggest that, as far as emerging markets are concerned, e-marketing communication of electric vehicles shows a high degree of non-authenticity. This is especially evident if we compare emerging and developed markets. Creating and sustaining digital communities that form the backbone of brand identities in developed markets is a challenge for a near future. The results of the study represent the initial phase of examining the issue of reputation management of entities operating in the field of low-carbon economy.

Keywords::
reputation management, low-carbon economy, sustainable development, emerging markets, Slovakia.

1 Introduction

The issue of reputation and reputation management is a phenomenon of the Internet age. Businesses, or even individuals, actively managed their reputation and built their brand even before the advent of the Internet, in any case, the number of variables for reputation management was greatly reduced, ie well controllable. With the advent of the Internet, the issue of brand protection has taken on a new dimension. The unregulated nature of the network, combined with unauthenticity and unpredictability, has multiplied the critical value of variables outside the controllable spectrum (Pollák 2015). However, the most successful ones were able to adapt or benefit from the diverse nature of the market. We purposefully avoid the terms "the hardest" or "the most diligent", as the success of e-marketing pioneers has brought a mix of several largely random variables. Mainstream marketers have benefited from examples of good practice. They regularly updated their knowledge, applied proven approaches and thus were able to adapt to a dynamic and hectic market. We see examples of successful adaptation especially in developed markets, the most successful representatives in the industry use best practices and formulas to build their identity. Authenticity, working with communities, play a crucial role. The brand's extensive ambassador base creates an ecosystem of synergies. This phenomenon is especially visible in corporations, which present their products as an answer and a solution for a sustainable future. Electromobility is one such trend. This is a trend that synthesizes both low-carbon and economically sustainable ideas. It is therefore assumed that the market will adopt the products promoted in this way without major problems. But what happens if the ideas of a sustainable future are presented in an emerging market? Marketing theories argue that emerging markets require a specific approach. In the past, this approach was mainly penetration pricing applications. At this point, we come to the initial problem of the presented study, namely how authentically new products presenting themselves in the online environment of the emerging market? We examine this problem in the empirical analysis of the presented study. In its first part, we describe the basic conceptual apparatus and present the key starting points of the issue. In the methodological part, we describe the basic apparatus for a simple analysis of sentiment, which forms the starting point for more sophisticated measures of reputation in the online environment. Subsequently, we will present the results of the empirical analysis, which we will discuss in more detail. In the conclusion section, we summarize the most important findings and formulate the preconditions for follow-up research.

The presented study is one of the initial outputs of a comprehensive research of the phenomenon of reputation in the context of a low-carbon economy.

2 Current state of knowledge of the analysed issue

The origin of electromobility dates to the 19th century. In 1834, Thomas Davenport built the first electric car that included a battery that could not be recharged. The car was able to reach 15 to 30 km. Its lifetime was therefore relatively short. Between 1834 and 1860, a lot of research and testing took place until the first rechargeable lead-acid batteries were invented in 1860 (Grauers, Sarasini, Karlström 2013). Electromobility, described as the movement of vehicles using electricity or the operation of electric vehicles, is a very wide area that needs to be understood not only in the context of general mobility but also as the overall functioning of modern human society in economic and social dimensions. The basic element of electromobility is the vehicle itself (Pollák, et al. 2021). An electric car is a road transport vehicle driven by an electric motor. Thus, electricity is needed to operate it. Electricity can be acquired or stored in various forms (Tesla.com 2019). Based on these differences described in the study of Amsterdam Roundtable Foundation and McKinsey and Company (2014) The Netherlands, we distinguish between the following types of electric vehicles:

- Plug-in hybrid electric vehicle (PHEV);
- Battery electric vehicle (BEV);
- Range extended electric vehicle (REEV);
- Fuel cell electric vehicle (FCEV).

The entry of e-cars to the transport market has also changed the transport ecosystem itself, including new and old brands. The operation of this mode of transport has its specific requirements that new players on the market try to meet. This situation creates space for new products and services (Konštiak 2015). The primary element of an infrastructure suitable for electric vehicles is its ability to recharge the batteries. An alternative to recharging is the replacement (swapping) of the batteries, or even companies providing full service for electric vehicles, e.g., GreenWay (2019). In the future, fuel cells can also be the solution for the range extension. These, through modern technology, can produce electricity from a variety of raw materials, and thus suppliers of these raw materials can also be part of the future infrastructure for

electric vehicles (Diampnd 2009). Electromobility in transport offers society various benefits, although there are still some limitations in this respect. Augenstein (In: Hawkins, Gausen, Strømman, 2012) mentions the following, that it has been shown that the transformative capacity of BEVs is high. Essentially this may mean that the BEV is doomed to fail eventually because it does not fit within the current mobility system and cannot compete with internal combustion engine cars. However, these shortcomings may turn into triggers for change, dealing with high prices and small ranges of BEVs by integrating them in intermodal mobility systems or car-sharing schemes and transport system in which multiple means of transport are used to transport people from point A to point B (Statharas et al. 2019, ACEA 2020). One of the benefits of electromobility is the ev-er-growing number of projects regarding this mode of transport. German Chancellor Angela Merkel reaffirmed the goal of 1 million electric cars running on German roads by 2020. This is, of course, is still a small percentage of the total number of vehicles, but this incentive may result in financial and various other types of state support. The support for electromobility also depends to a large extent on those who bring new ideas regarding e-mobility. However, the momentum in the development of e-mobility will not be lost, due to landscape factors such as scarcity of resources and developments in the Chinese market. Europe in general does not lag in the field of electromobility. The largest institution on the continent is the European Union. Several projects are being implemented thanks to its support. However, from a market point of view, this is a highly homogeneous environment, while in the northern and western parts of Europe there is a significant upward trend in electric cars, in Central and Eastern Europe the market is still in shape. The combination of the developing market, the absence of a consumer base, or the disorganized nature of the Internet creates an ideal environment for the implementation of empirical research, which we focus on in the forthcoming part of the presented study.

3 Materials and Methods

The main goal of the presented study is to provide an analytical view of the issues of online reputation of selected electric vehicle manufacturers. The issue is examined in the context of the developing market of the Slovak Republic. The initial research problem is based on the main goal of the study. It is a matter of clarifying how authentic electric vehicles are presented in the online environment of an evolving market. The research group includes all electric cars that are available on the market

of the Slovak Republic. The research sample consists of 10 electric vehicles, marked by the portal Mojelektromobil.sk (2021), as the best electric cars for 2021. The basic methodological apparatus for empirical analysis is a simple sentiment analysis (Pollák 2015, Pollák, Dorčák, Markovič 2021), through which it is possible to quantify the level of online reputation according to the sentiment (polarity) of the first ten Google search results of a particular subject. The subject's own name, in this case the brand of the electric car, serves as the search phrase, then the search results in each of the ten positions are quantified according to the following key:

Table 1: Sentiment analysis

Source: Pollák (2015)

Sentiment / Position of the result	1	2	3	4	5	6	7	8	9	10
Positive sentiment +	20	19	18	17	16	15	14	13	12	11
Custom web site of the organization x	10	9	8	7	6	5	4	3	2	1
Neutral sentiment ±	2	2	2	2	2	2	2	2	2	2
Negative sentiment -	- 20	- 19	- 18	- 17	- 16	- 15	- 14	- 13	- 12	-11

In order to minimize the customization of the results, the anonymous browsing mode is selected during the search, at the same time only the organic search results are quantified. Results marked as ads are not considered. If multiple occurrences of the test subject's own website are recorded in the search result, a neutral sentiment is attributed to the second to nth search results of this nature. The polarity of the result is determined based on data that are directly visible from the link, so it is mainly the title and perex. The same analysis is prepared for each of the evaluated entities, a partial reputation indicator is determined for each of the positions, and subsequently a total value is created by their sum. The aggregate value for each of the test subjects is converted to percentages. We assume that each subject can achieve a maximum of 155 points, which is 100% in percentage terms. One percent is therefore proportional to 0.645 points. Based on the overall percentage of online reputation, it is possible to compile a simple ranking that will provide an overview of the mutual position of the tested entities (SA score). For the purposes of our analysis, we extend the overall ranking by two parameters, the first is the price

anchor, it is a percentage expression of the price of a particular electric vehicle to the most expensive electric vehicle in the tested group. The second parameter is the Price-Reputation coefficient, which is determined by the difference between the price anchor and the level of online reputation determined based on a simple sentiment analysis. We add both coefficients to the analysis in order to better interpret the context. Data for empirical analysis were read manually, the data collection itself took place in January 2022. The results were processed by a spreadsheet processor MS Excel, selected contexts were interpreted by means of a histogram.

4 Results and discussion

Selected electric vehicles were subjected to a basic online reputation analysis, the following table presents the values of individual monitored indicators for each of the analyzed entities as follows:

Table 2: Online reputation based on sentiment analysis
Source: own processing

No.	Subject/ Result sentiment	SA score (%)	Price anchor (%)	P-R koef. (Δ %)
1.	Tesla Model 3	27,09	27,13	-0,04
2.	Volkswagen ID.3	42,57	18,76	23,81
3.	Porsche Taycan	54,18	100,00	-45,82
4.	Škoda Enyaq iV	62,57	19,37	43,20
5.	Fiat 500e	68,37	12,91	55,46
6.	BMW iX3	93,53	36,02	57,51
7.	Audi E-tron GT	72,89	52,60	20,29
8.	Hyundai Ioniq 5	70,31	21,81	48,50
9.	Kia e-Niro	72,89	20,97	51,92
10.	Jaguar I-Pace	49,02	41,83	7,19

As we move on to the description and discussion of the individual subjects, we consider it necessary to interpret the selected contexts through the following figure.

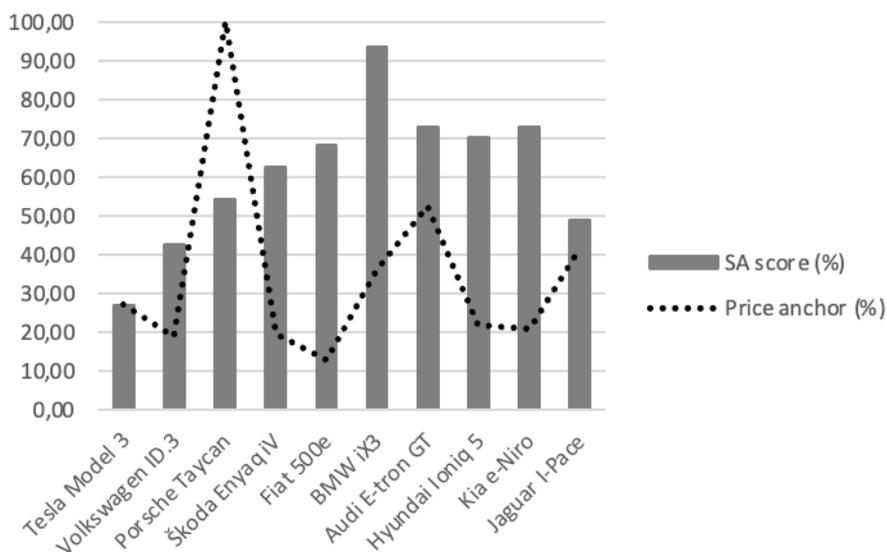


Figure 1: Interpretation of selected relationships

Source: own processing

As for the individual test subjects, from the point of view of their presentation, we record various facts through the first ten results of search in google. Tesla model 3- In the first position of the search results is the company's own page, followed by a report of rising prices, this is the place, where we record the first negative sentiment. In the third and fourth position there are links to the magazine and car bazaar, we record a dominantly neutral sentiment. In the fifth place we find a link to the portal of the internet seller - the company Alza, which has a content of significantly positive sentiment, as the published report contains all the necessary keywords. The following are two links to the car bazaar. At the end of the results, a link to the Wikipedia page is recorded once during the measurements of the research sample. Standard links to the Internet encyclopedia give subjects a touch of global acceptance and tradition. The last link is a page offering a ride in Tesla, the page allows the user to rate the content, this rating is then highly positive. Overall, it can be stated that despite the relatively high potential in terms of the analyzed presence of a particular electric car, we do not find any references to customer communities, events or organic synergies among the search results. This indicates a poorly developed market. Volkswagen ID.3- Own page is followed by a page with relatively neutral sentiment, in the third place we find a link to the portal about cars, a suitable

choice of keywords ensures a significantly positive sentiment. A link with neutral sentiment follows. In the fifth position we find a link to the test with positive sentiment. This is followed by another test and the introduction of a car with a mention of a high price, which we evaluate as negative sentiment. Finally, we find a link to the car bazaar, the last measured search result is a link to a test on YouTube, by inappropriate choice of keywords in the title, the search result reduces the content of the page only to a neutral position. Porsche Taycan- In the first position of the search results there is a custom page, which is followed by a car bazaar page and another link to a page within the subject's own domain. The following is a page about electric cars with neutral sentiment. In the fifth position we find a link to the page about electric cars with positive sentiment referring to the price of the car (even though it is the most expensive electric car among the evaluated) the optimal choice of words ensures the recording of positive sentiment. The following is a link to the car bazaar and the YouTube video, with the YouTube video having the optimal words selected in the description. We are seeing another positive sentiment. In the end, we find links to news and tests in the media, again we evaluate the choice of words as appropriate. The last link is a link to a portal offering insurance, in the article the portal mentions a car, again (despite the high price) we see the optimal choice of words towards achieving positive sentiment. Overall, the results are dominantly random and inorganic in nature, we do not notice any signs of optimization. Škoda Enyaq iV- The car's own page is followed by a link to another own page within the manufacturer. The following are two media-related occurrences, with a suboptimal choice of words indicating a high price within the carmaker's portfolio (even though it is one of the cheapest cars in the sample). By choosing words, both occurrences are evaluated at the level of neutral sentiment. This is followed by an occurrence with positive sentiment, while the optimal choice of words is visible. The following is a media mention. Again, the optimal choice of words is recorded. Other occurrences are dominated by magazines and media, they achieve optimal word choice and thus positive sentiment. However, the presentation from the overall point of view has visible absence of targeted optimization. Fiat 500e- The car's own page is followed by a positive media report, recording the optimal choice of words. Other media reports and tests follow. In the first case, the search result has a dominantly neutral sentiment, which is followed by two occurrences, the first with highly positive sentiment rates, but the second, despite its commercial nature, does not have an optimal title design. We quantify it at the level of neutral occurrence. The following are the dominant positive mentions in the

media, but these are mentions that have all the features of a commercial nature. The last occurrence is a link to the seller, who is rated neutral. Again, we note the absence of synergies. BMW iX3- The subject's own website is followed by media reports, similarly to Porsche, we see the optimal choice of words, especially when it comes to the price of the car. The fourth is a link to the page about electric cars, which has an optimal choice of words compared to previous tested cars (perhaps only except for Porsche), we find better optimized text and we record positive sentiment. We also see excellently managed work with the media in other occurrences. The news emphasizes both innovation and tradition. Of the rated cars, the BMW iX3 achieves the highest level of online presentation in search results. Here too, however, we must state that due to previous measurements in the reference developed markets (Pollák, Dorčák, Markovič 2021), the car does not record any synergistic or significantly organic occurrences from the point of view of presentation. Presentations thus look artificial. Audi E-tron GT- Own page is followed by news with neutral and subsequently positive sentiment. Subsequently, we find the subject's own page located in the USA and a positive mention in the magazine about electric cars. This is followed by a media mention with a markedly positive sentiment. In the end, we find a YouTube test with positive sentiment and media output of a positive nature. However, as in previous cases of German electric cars, the presentation looks very impersonal and inorganic, making the products inaccessible. In our opinion, this reduces the creation of synergistic effects of e-marketing communication. Hyundai Ioniq 5- The car's own page is followed by two media mentions of a dominantly positive nature. Search occurrences are followed by a neutral homepage sentiment in a different geographic location. In other positions we find positive mentions in the domestic media. Another occurrence is a link to a YouTube video, followed by a video localization outside of the watched market. Next is the site located on the North American market. The latest occurrence is a link to a local magazine with positive sentiment. There is a lack of more local content to better assess the subject's overall presence. We also attribute this fact to the nature of the market and the market potential of the electric car. Kia e-Niro- The car's own page is followed by a link to a medium with a dominantly neutral sentiment. There is a positive mention within the same portal. In fourth place is a link to a local reseller. In the fifth to seventh positions are occurrences within one medium. These are dominantly positive in nature and represent a series of reports of the nature of an editorial PR article on an electric car, starting with a presentation and ending with a long-term test. The following are press releases with positive sentiment. Even though it is an

electric car from the more affordable price half within the analyzed set, even in this case the online presentation looks inauthentic and artificial. Jaguar I-Pace- The car's own page is followed by a page within the manufacturer's domain. The following is a link to the seller alza.sk with neutral sentiment. Other positions include press releases, the first has a markedly positive nature, the second has only the nature of neutral sentiment due to the suboptimal choice of words. The following occurrence mentions them on the local reseller's page. Another link is a YouTube video from local influencer testing with the nature of positive sentiment. The following is an editorial in the media that is highly positive in nature. In the penultimate place, there is a link outside the analyzed market, but from the point of view of measurement, this is the first occurrence having the nature of an organic search result generating synergies. This is an evaluation of the electric car by users, although the rating reaches 75%, it can be seen as a result of a positive nature. In the last place is a link to the site of the local seller. Let us therefore proceed to the conclusion of the results.

5 Conclusion

As part of the analysis, we compared ten selected representatives of electro-mobility operating on the Slovak market based on search results. Their presence in the online environment is relatively robust, especially when it comes to basic quantification parameters. In terms of the total potential expressed by the sum of individual sentiments of the entity in the top ten places in Google search results, up to 7 out of 10 entities reach a level corresponding to 50% and more in terms of full online potential. From the point of view of entities with a real market share, the level of 50% potential is not only reached by VW and Jaguar electric cars. As for the best subject among the analyzed, it can be stated that the BMW iX3 electric car has the best managed online communication. With more than 90% of its potential, it reaches the threshold value of the maximum score according to the chosen methodology. This fact, among other things, indicates a well-managed work with the media. When it comes to interpretations of selected contexts, the situation is even more diverse. In the whole tested sample defined by the price anchor (the price of the most expensive of the analyzed electric cars) reaches (almost) a balanced level of reputation compared to the price with respect to the price anchor only Tesla model 3. The highest level of online reputation potential compared to the price anchor is achieved by BMW iX3 electric vehicle 51%, followed by Fiat 500e and KIA e-Niro. All the mentioned electric cars reach the value of the coefficient at the level of 50%.

The lowest value of the electric cars, namely the Porsche electric car, achieves the lowest reputation value compared to the sale price. From the point of view of general findings, it can be stated that the market as such is so far dominantly new for electromobility, even though the prices of the products offered are in no way penetrating. The nature of the market response also corresponds to this. Customers are only slowly looking for a way to new products, their activity in the online environment corresponds to the trace elements of electric vehicles in traffic. Although the presentation of electric cars in the online environment is represented by relatively high values of the level of online reputation, they are based on dominantly inorganic and relatively inauthentic press releases and paid marketing communication products. In selected cases of absence of relevant domestic content, there are also geographically irrelevant pages in the search results that further alienate products from potential customers. Weak market penetration is also reflected in the practical non-existence of local customer communities, the absence of results in the form of forums and discussions, or spontaneous clubs and centers generating positive deviations. Or even synergies, so necessary for the adoption of new products in emerging markets. Except for Tesla, which disappears with model categorization, we find almost no occurrence of organic market vitality in the top ten Google search results. Based on the assumption that electromobility is not only a global trend, but also an evolutionary shift in mobility as such, we expect a rapid increase in the activity of all market entities in the next period. The presented study was intended to describe the baseline in examining the importance of reputation in a low carbon economy. From the point of view of partial results, we identified selected variables, and by quantifying them, we determined the basic empirical framework for further research. The nature of the market creates space for continuous research. Partial research results have a high application potential not only for the development of the issue from the point of view of science, but also a significant application potential for business practice. From the point of view of research limitations, it is necessary to point out the locations of the analyzed subjects and also the chosen language for sentiment analysis. The nature of the market creates a unique space for the study of the issue in its beginnings, even though the level of knowledge within the topic is strongly developed on a global scale. The issue's paradigms generate a broad portfolio of opportunities for further empirical research. Local specifics, in turn, largely create a demand for specific knowledge that arises from the synthesis of global knowledge and local data. The presented study is therefore presented as one of the portals to the analyzed topic.

Acknowledgements

This article is one of the partial outputs of the currently solved research grant VEGA no. 1/0240/20.
This article is one of the partial outputs of the currently solved research grant VEGA no. 1/0140/21.

References

- ACEA. (2020). Electric Vehicles: Tax Benefits & Purchase Incentives. The 27 Member States of the European Union and the United Kingdom, July 2020. Available online: <https://www.acea.be/publications/article/overview-of-incentives-for-buying-electric-vehicles> (accessed on 20 July 2020).
- Battery Swap Event Full Charge in 90 Seconds. Tesla Motors. (2019). Výmenníky Batérií od Tesla Motors. Available online: https://www.tesla.com/en_EU/videos/battery-swap-event (accessed on 30 July 2020).
- Diamond, D. (2009). The impact of government incentives for hybrid-electric vehicles: Evidence from US states. *Energy Policy* 2009, 37, 972–983.
- Electric vehicles in Europe: Gearing up for a New Phase? Amsterdam Roundtable Foundation and McKinsey & Company. (2014). Available online: <https://www.mckinsey.com/featured-insights/Europe/electric-vehicles-in-Europe-gearing-up-for-a-new-phase> (accessed on 6 August 2020).
- Grauers, A., Sarasini, S., Karlström, M. (2013). Why electromobility and what is it? Systems Perspectives on Electromobility. ISBN 978-91-980973-1-3.
- GreenWay—Mapa pokrytia na Slovensku. GreenWay.sk. (2019). Available online: <https://greenway.sk/nase-stance/> (accessed on 14 August 2020).
- Hawkins, T.R., Gausen, O.M., Strømman, A.H. (2012). Environmental impacts of hybrid and electric vehicles—A review. *Int. J. Life Cycle Assess.* 2012, 17, 997–1014.
- Konštiak, L. (2015). Rozvojový Zámer Elektromobility Pre Vybraný Podnik. Diplomová Práca, Odbor Manažment, Fri Uniza, Žilina, Slovakia.
- Mojelektromobil.sk. (2021). Najlepší elektromobil pre rok 2021. Available online: <https://www.mojelektromobil.sk/najlacnejsie-elektromobily-slovensko-cena-pod-10000-eur/> (accessed on 1 January 2022).
- Pollák, F. (2015). On-line reputačný manažment v podmienkach stredoeurópskeho virtuálneho trhu. Prešov: Bookman.
- Pollák, F., Vodák, J., Soviar, J., Markovič, P., Lentini, G., Mazzeschi, V., Luè, A. (2021). Promotion of Electric Mobility in the European Union—Overview of Project PROMETEUS from the Perspective of Cohesion through Synergistic Cooperation on the Example of the Catching-Up Region. *Sustainability* 13, no. 3: 1545.
- Pollák, F., Dorčák, P., Markovič, P. (2021). Corporate Reputation of Family-Owned Businesses: Parent Companies vs. Their Brands. *Information*. 2021; 12(2): 89.
- Statharas, S., Moysoglou, Y., Siskos, P., Zazias, G., Capros, P. (2019). Factors Influencing Electric Vehicle Penetration in the EU by 2030: A Model-Based Policy Assessment. *Energies* 2019, 12, 2739