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Crisis management and social media:

An analysis of the Volkswagen's web reputation on Twitter after the explosion of the "Dieselgate" scandal

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ABSTRACT

Volkswagen, the leading European auto manufacturer based in Wolfsburg, Germany, is facing the most complicated scandal of its entire history. This shocking business crisis is the starting point for the development of this master thesis. In this final paper, the increasing importance that social media like Twitter today have for organisations in the management of a crisis is analysed. The aim is to identify the "best practices" to face a negative event, but also to understand how the bad management of a critical situation can deeply damage a company and its reputation, above all on the web and on social media. In more detail, this thesis is divided into four parts. In Part 1, the most important literature and studies about crisis management are presented. Part 2 is focused on the analysis of the role of social media in the management of a scandal or a disaster. The third chapter is dedicated to the emissions scandal that hit Volkswagen and to the response of the company, while in the last part, the results of a research on the web reputation of the company on Twitter after the explosion of the *dieselgate* are presented.

Key Words: Crisis management; Reputation; Web Reputation; Social media.

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INTRODUCTION

Volkswagen, the leading European auto manufacturer based in Wolfsburg, Germany, is facing the biggest and most complicated scandal of its entire history. The so-called *"Dieselgate"* which exploded on September 2015 gained worldwide media attention, and the costs and the consequences for the company both in the short and in the long term are today difficult to foresee. This shocking business crisis is the starting point for the development of this master thesis. A lot of marketing experts, public relations practitioners and business researchers started to analyse the scandal along different perspectives, giving a significant contribution to the discipline of crisis management.

Starting from these points, what I wanted to study in this final thesis is the increasing importance that social media like Twitter today have for organisations in the management of a crisis. The aim is to identify the opportunities and the "best practices" to face a negative event, but also to understand how the bad management of a critical situation can deeply damage a company and its (online) reputation, above all on social media.

In more detail, this thesis is divided into four parts.
In Part 1, the most important literature and research lines about crisis management are presented. After a definition of the nature, types and consequences of a business crisis, the chapter continues with the explanation of the necessity for organisations to be prepared in facing adverse situations, identifying step-by-step how to handle effectively a crisis, according to the experts.

Part 2 is focused on the analysis of the role of social media in the management of a scandal or a disaster. The chapter begins with a definition of what constitutes and affects the reputation and the web reputation of an organisation, considering specially the importance of the brand and the influence of the word-of-mouth. After a brief description of the most used social networks, this second part continues with the presentation of wide-accepted theories about social media crisis management and the derived best practices, above all on the aspect of crisis communication.

The third part of this master thesis is dedicated to the scandal that hit Volkswagen and the entire automobile industry. After a careful description and summary of the most important events from September 2015, the focus of the analysis regards the crisis management

programme of the German Group, primarily considering their response online:
Did Volkswagen follow what the theory defines as "best practices"?

In the last chapter, I present the results of a research I conducted about the web reputation of the company on Twitter after the explosion of the *dieselgate*. In doing this, I gathered 115,162 tweets as a significant sample for the study, in a limited period of time (18/09/2015 – 26/10/2015). Using R, the open-source and free software for statistical computing, to process textual data, I focused the analysis on three main parameters affecting the web reputation: the frequency of the tweets in the period and how it variates according to the events happened; the most frequent words and their variation in the five weeks; and the sentiment and the emotions that can be derived from the tweets on a daily base.

Part 1. CRISIS MANAGEMENT

1.1 - *What is a crisis?*

The Oxford Dictionary defines a crisis as "a decisive moment - a time of great difficulty, a disaster, a catastrophe", or in other words, "a turning point that changes the destiny of an individual, a company or a government" (Oxford Dictionaries 2016).

In its general meaning, a critical situation can be outlined as "a condition of instability in social, economic, political or international affairs leading to a decisive change" (Mukhopadhyay, A. K 2005). In fact, the common element, which can be derived from a myriad of explanations of this term, is that a crisis is the stage in a sequence of events at which the future of all subsequent events, for better or for worse, is determined, as clarified by the Indian professional manager Asim K. Mukhopadhyay in his book *Crisis and Disaster Management Turbulence and Aftermath* (2005).

Assuming these general definitions, this study will consider only business crises, i.e. the negative occurrences that hit companies and organizations. According to Dr. W. Timothy Coombs, professor at the University of Central Florida and one of the main experts in the discipline of crisis management, business crises imply "a significant threat to operations and reputation", which can lead to serious consequences if not handled properly in short times or underestimated (Coombs 2014). It is important to consider that, when a company is facing a crisis, the effects of this situation not only affect the organisational entity at issue, its internal structure and market relations, but also involve, in favourable or unfavourable ways, external stakeholders, competitors or a whole industry. As emerged, the *dieselgate* scandal confirms surely this fact. Jonathan Bernstein, president of Bernstein Crisis Management, Inc. and worldwide recognised as a guru in crisis management and public relations, underlines in addition that any fact could potentially damage a company's reputation or finances, leading to a business crisis (J. Bernstein 2011). Many events at first blush may not be considered so relevant. For example, the resignation of a key person, or just a wrong tweet. Other events assume instead just from the beginning a greater relevance, such as natural catastrophes, product defects, or hacker attacks. The list is endless. Some can dissolve in just few days. Some can determine the death of a company. As Bernstein pointed out in his book *Manager's Guide to Crisis Management* (2011), the majority of such crises can be managed effectively with honesty, accepting also that "it may be necessary to absorb losses over the short haul […] in order to achieve a

long and healthy business life".

Recapping, the common elements that characterise a crisis are: 1) a threat to the business, 2) the element of surprise, and 3) a short decision time. Steven J. Venette, professor of Communication Studies at the University of Southern Mississippi, highlights another aspect, precisely that "a crisis is a process of transformation where the old system can no longer be maintained" (Venette 2003). Therefore, the fourth element is the need for change. In fact, if a changing process is not needed, a negative event can be easily considered just as a failure or incident, and nothing more.

Considering the previous definitions, what is clear is that "crisis" is a relative and contextualised term, because the gravity and magnitude of the situation is always different from case to case, from one company to another, and from place to place.

1.2 - Classification and consequences of crises

Even if the number and types of potential crises are enormous, many authors have tried to cluster them. As it will described in next chapters, this categorization can be useful because different types of crises necessitate the use of different strategies and responses.

Erika Hayes James, organisational psychologist at the University of Virginia's Darden Graduate School of Business, recognizes two primary categories of organisational crises: "sudden" and "smoldering" crises (James 2008). In her paper *Crisis Leadership* (2008), James defines sudden crises as "circumstances that occur without warning and beyond an institution's control". Consequently, the responsibility of the organisation for the negative effects that has been caused is low and its top management is in most cases not blamed for it. Smoldering crises differ from sudden ones: beginning as minor internal issues, then they develop to crisis status due to manager's negligence or incapability. These are situations in which there is a clear responsibility of the company, and the damages, above all in terms of reputation, are difficult to fix.

Bernstein provides a similar partition, differentiating those events over which an institution has no control, such as natural disasters or armed conflicts, from situations in which a company can be hold accountable for the consequences of its bad management or wrongdoing, intentional or not (Bernstein 2011). A clear example of the second category is the BP oil spill happened in the Gulf of Mexico in 2010. The author focuses his attention also on another type of self-caused crisis that often hit well-known organizations, due to their "overconfidence of invincibility". In these situations, companies "believe that because of their importance they can ride out any issue or problem" (J. Bernstein 2011), just ignoring what is happening or covering the rumours. It is very risky to believe in one's invincibility: what is at stake is the trust and respect of the consumers, and once lost, the process to retrieve it is long and difficult. Volkswagen's controversial response to the last scandal in the European market has caused a significant fall of the Group sales in Europe (-3,8% in January 2016 compared to the previous year), as reported by ACEA, the European carmaker's Association (The Associated Press 2016).

Other experts provide a more detailed classification of crisis typologies. Dr. Otto Lerbinger, Professor Emeritus at the Boston University, in his book *The Crisis Manager: Facing Disasters, Conflicts, and Failures* (Lerbinger 2012) categorizes three main groups:

1) Crises of the physical world
   i.   *Natural calamities*: environmental phenomena such as tsunamis and earthquakes, whose consequences can deeply affect an organization's business and operations;
   ii. *Technological crises*: accidents deriving by the application of science and technology, caused by human error or system failures (Human or technological breakdowns). A dramatic example is the Chernobyl explosion.

2) Crises of human climate
   i.   *Confrontation crises*: Typically in form of boycotts or sit-ins, when antagonist groups fight a company or its products to defend their ideals or concentrate media attention about a problem. Famous examples are the boycott of Nike's shoes due to child labour, or of Moncler's jackets due to brutal production processes;
   ii. *Malevolence*: hostile acts of governments or extremist groups, which use forms of violence to force compliance with their demands. Examples include forced expropriations of property, extortions, hacker attacks, product tampering and, in worst cases, terroristic actions.

3) Crises of Management Failure
   i.   *Mismanagement*: ordinary failures and mistakes made by the company in planning and taking strategic decisions;
   ii. *Skewed values*: when management is excessively focused on improving short-term economic gain and the interests of stockholders at the expense of other stakeholder interests, such as employees, social community and environment.
   iii. *Deception*: misrepresentation of information about an organization and its products when dealing with consumers and others. The 2008 financial crisis is the last striking case;
   iv. *Misconduct*: unethical, illegal, criminal acts of management misconduct. Volkswagen's software to reduce emissions under test conditions is surely part of this category.

Coombs and Holladay, in their article *Helping Crisis Managers Protect Reputational Assets - Initial Tests of the Situational Crisis Communication Theory* (2002) identify three main aggregates, analysing the level of responsibility for a crisis that people tend to attribute to an organization:

1) Victim Crises: Minimal Crisis Responsibility

The Victim cluster has minimal attribution of crisis responsibility and includes natural disasters, rumours (false and damaging information about a company), workplace violence and malevolent acts by external people.

2) Accident Crises: Low Crisis Responsibility

The Accidental cluster recognises low attribution of crisis responsibility. The cases considered are challenges (stakeholders' complaints about an inappropriate operating management of the company) and technical-error accidents and product harm, i.e. when technology failures cause industrial accidents or defective/harmful products.

3) Preventable Crises: Strong Crisis Responsibility

In these situations, an organisation is considered strongly responsible for the crisis status. Human-error accidents and product harm, together with organisational misdeed, i.e. putting stakeholders at risk and/or violate the law, constitute this cluster. Again, connecting the theory with practical cases, the unfair behaviour of VW in relation to emissions standards belongs to this last group.

After having presented widely accepted classifications of crises, it is also of primary importance to consider which are the main consequences an organization has to face. As described above, each situation is different and the effects are in most cases unique and dependent on the particular context. Given this necessary premise, it is possible to affirm that a crisis can cause three related threats: public safety concerns, financial losses and reputational damages (Coombs 2014). Some crises, such as industrial accidents or product defections, can cause injuries and even loss of lives. In other circumstances, the disruption of operations, the loss of market share and sales volumes or the proliferation of lawsuits related to the scandal can deeply damage the financial resources of a business entity. Many authors agree that, in every critical event, the organization's reputation could be negatively affected to some degree (Dilenschneider 2000; Coombs and Holladay 2006; Newmark, Masum, and Tovey 2011). As it is easy to understand, these three threats are strongly interrelated. The reputation, a valuable and intangible asset of a company, affects finances, e.g. in terms of consumer's purchase intentions or variations in share value. In the same way, accidents causing damages to properties or people not only has an impact on costs, but also causes reputation losses putting a company's moves under strict investigation. Different experts suggest that these threats must be handled sequentially (Coombs

2007; Lerbinger 1997): public safety is at the first place. If an effective action to solve public safety concerns is not applied in short times, the overall damages for the company will intensify. Reputation and financial concerns should be faced only after public safety has been assured.

Considering the *dieselgate* that has severely hit Volkswagen, as it will be accurately described in chapter 3, the consequences for the German automobile giant has been, and will be, extremely heavy. About public safety, an environmental study conducted by MIT researchers revealed that the "pollution from vehicles at the centre of Volkswagen's ongoing emissions scandal may have contributed to 60 premature deaths in the United States" (Worland 2015), because of the excessive level of nitrogen oxide emissions.

In terms of reputation and financial losses, the consequences appear to be even worse. In the year 2015, Volkswagen Group reported the largest annual losses in its entire history, forecasting a 16.2 billion euros ($18.2 billion) cost for its emissions-test cheating trick (Cremer and Taylor 2016). Company's reputation fell dramatically, as emerged in the The Harris Poll® 2016 Reputation Quotient® (RQ®) Summary Report, in which Volkswagen drops to the bottom of the 100 most visible companies in the U.S., receiving a "very poor" rating (Table 1).

Table 1 - The Harris Poll 2016 Reputation Quotient: Automotive Companies Ranked Among the Top 100 Visible Companies in the U.S. by Corporate Reputation Strength

Automotive Company	RQ Rank	RQ Score
Honda Motor Company	17	79.16, Very Good
BMW	33	76.37, Very Good
Ford Motor Company	50	74.10, Good
Toyota Motor Corporation	63	71.50, Good
General Motors	81	66.27, Fair
Fiat Chrysler Automobiles	82	66.07, Fair
Volkswagen Group	**100**	**54.75, Very Poor**

Source: The Harris Pool 2016a

1.3 - *Crisis Management: a vital function for companies*

In such a pressing and continuously changing world for businesses today, a crisis is just around the corner. Assuming this fact, companies should consider their philosophy, their strategy and their honesty. What they have to do is taking action to evaluate and protect their vulnerabilities, but at the same time planning and testing adequate responses in the best interests of all internal and external stakeholders. In order to face these necessities, crisis management has become today a critical organisational function. Many authors affirm a clear difference between crisis and risk management: Coombs (2014) underlines that while risk management consists in "assessing potential threats and finding the best ways to avoid those threats", crisis management is a more comprehensive process, dealing with threats before, during, and after they have been experienced. This managerial discipline requires skills and techniques necessary to identify, assess and cope with a damaging event, before the moment it first happens to the point of recovery.

Mitroff, in his book *Managing Crises Before They Happen* (2000), criticises traditional risk analysis because it mainly considers only those crises that a company has already faced or that are more common. Analysing and weighting the probabilities of occurrence of various threats based on historical data, risk analysis models traditionally give high weight only to certain types of crises to prepare for. According to the author, the mistake behind this process is that "it is precisely those crises that have not yet occurred to an organisation that need to be considered"(Mitroff 2000).

Crisis management is a situation-based management system (Lerbinger 1997), in which roles and responsibilities should be clarified in advance and different processes and scenarios assessed and tested company-wide. An effective system includes action in the following areas: crisis prevention, crisis assessment and response, and crisis termination (Thomas 2016). Many aspects should be carefully considered, for example:
- Establishing different risk factors and critical scenarios, and the consequent response mechanisms;
- Incorporating effective methods to contrast both the reality and the perception of crisis, online and offline;
- Preparing flexible communication strategies to reach different interest groups (Mukhopadhyay, A. K 2005).

Tucker and Melewar (2005) argue that the aim of crisis management is to be ready and

proactive in times of difficulty, with a timely and adequate reaction to the crisis, following a clear line of reporting and communication inside the company and with external entities; at the end, rules for crisis termination must be discussed and agreed with all stakeholders. By their very nature, crises require managerial decisions to be made in a very short time frame, and often after the dangerous event has already occurred. In order to decrease uncertainty in these situations, organisations normally establish a crisis management plan (Stibel 2008). However, due to the unpredictability of many events, organisations must recognise the potential for deep changes to their current business modus operandi (Coombs 2014).

Another aspect of this discipline which has been strongly discussed is the role of communication and public relations. Public relations practitioners are a fundamental part of crisis management teams, whose main goal is to recover any damage to company reputation and to assure stakeholders about taking care of their interests (J. Bernstein 2015). Different experts (Mitroff 2000; Vecchiato 2016), however, note that many organisations consider crisis management only under the profile of public relations. In other terms, they focus their attention primarily on the media and on their role in spreading/manipulating news. From this perspective, the media are actually a cause of crises, and the problem becomes for companies how to communicate effectively with them in relation to a negative event. Preparing for the media is consequently the only solution to face a crisis for these organisations, but while crisis communication is surely an important aspect of crisis management, an effective process involves much more.

What constitutes an effective crisis management programme? In the next paragraph, a set of best practices and lessons from the experts in this field will be discussed.

1.4 - *Effective Crisis Management: best practices*

An effective crisis management does not consist simply in reacting to a major crisis after it has started. It is a whole and comprehensive process, aimed at both preventing and limiting the damage a crisis can inflict on a business entity and its stakeholders. As a process, it is more than a simple reaction. According to Coombs (2014) and Poma and Vecchiato (2012), crisis management can be divided into three time phases: 1) pre-crisis, 2) crisis response and 3) post-crisis. The first phase means, in general, prevention and preparation, focusing on the creation of a crisis management plan and team. The crisis response constitutes the practical implementation of the lines and plans decided earlier, in which responsiveness and key spokespersons play a fundamental role. The post-crisis phase has a triple function: analysing and measuring the effects suffered; continuing the process of recovery, above all in terms of reputation; better preparing for the next crisis, investigating the effectiveness of what done during the crisis phase.

This tri-part view of crisis management is useful in presenting the best practices that many experts have proposed when facing adverse situations, and that will be discussed in next paragraphs. Nonetheless, as the same authors point out (Mitroff 2000; J. Bernstein 2011; Coombs 2014), even with the best of frameworks and the best of preparations, it is impossible to foresee the complete range of potential crises, and the setting up of an adequate response to each of them. However, the consequences of all crises can be reduced and managed far more effectively following the essential basics of this discipline.

1.4.1 - *Pre-Crisis phase: designing a Crisis Management Plan and Team*

The right management of a critical situation starts before a negative event happens. The initial phase is a "researching activity" (Poma and Vecchiato 2012), in terms of prevention and preparation. Prevention means investigating all potential vulnerabilities of the company, to reduce known risks (Coombs 2007). Mitroff (2000) underlines the importance of not limiting the research only on the more probable adversities, but to consider, in the creation of a crisis management programme, also those events that are less common, and for this reason even more dangerous. Preparation involves the definition of the crisis management plan, the selection and training of the specific crisis management team, and the testing, on a regular time basis, of the crisis management plan and team through

exercises and simulations. As many studies reveal (Lerbinger 2012; Poma and Vecchiato 2012), however, managers in most cases do not give enough importance to this phase, not recognizing how high is today the risk to be surprised by a critical event. No one can be considered immune, and the probability of those events is higher than commonly expected, above all on a long-term perspective. For this reasons, crisis management professionals highlight the necessity of prevention and preparation as defence mechanisms for companies. What is fundamental for organisations is a new approach to this discipline: the question is not if it will face a negative situation, but instead when and how the company will be hit, and how large the consequences will be. The main question is, however, if a crisis can be managed by the organization in an effective way (Vecchiato 2016).

As Poma and Vecchiato argue in their book *La guida del Sole 24 Ore al crisis management*, an useful tool in the prevention and preparation for crises is the so called "Deming Cycle", or "PDCA cycle", created by Edward Deming in the 50s. This method, part of the Total Quality Management theory and initially applied by Japanese companies with the aim of a continuous improvement in product and process quality, can be used in planning the business continuity of an organisation. For the completeness of the information, "Business Continuity is defined as the capability of the organization to continue delivery of products or services at acceptable predefined levels following a disruptive incident" (Source: ISO 22301:2012, (Business Continuity Institute 2016)). The application of the Deming cycle (Picture 1) in the prevention of a critical event implies a constant interaction between four sequential phases:

Picture 1 - The Deming Cycle

• **Plan**, i.e. the elaboration of a list of possible critical areas and draft initial procedures to solve them;
• **Do**, i.e. the procedure is tested in limited contexts and areas with simulations of crisis scenarios;
• **Study/Check**, i.e. the analysis of the results and feedbacks deriving from the application of the draft procedure;
• **Act**, i.e. the process is improved according to the feedback obtained, and applied when definitive.

Source: deming.org

This method allows a continuous monitoring of the internal and external areas

of danger, and a faster and more effective response in times of crisis due to the regular tests and simulations of similar events (Poma and Vecchiato 2012).

To analogue conclusions come also Barton (2001) and Coombs (2006). The authors in their researches document that organisations manage crises in a better way if they:

- design a crisis management plan and update it constantly (annually);
- form a specific crisis management team;
- test the plans and teams at least annually through exercises;
- prepare draft crisis messages for the initial response.

A crisis management plan is just a reference tool. It should not be considered as a systematic and univocal set of instructions for what to do in times of difficulty (Coombs 2007). Coombs, in his book *Ongoing crisis communication: Planning, Managing, and Responding (2007),* provides a detailed description in fifteen points of the structure of a similar plan. Briefly, it should contain lists of key contact information, clarifying who to contact and how. It can include reminders as checklists of key actions, which are considered necessary or useful during a crisis. Usually, methods for documenting the actions taken are also explained. However, it is important to bear in mind that each crisis is unique, and relying completely on a crisis management plan designed a priori could be a bad decision. It has to be adapted to match the specific crisis (Lerbinger 2012). In addition, a crisis management plan has no value if not tested and practiced in simulations or exercises, in order to find the weaknesses that must be addressed before real adversities (J. Bernstein 2011). Many experts recognise the value of setting up a proper plan in terms of both increased speed and quality of the response (Barton 2001; Lerbinger 2012; Coombs 2014). By pre-assigning some tasks and organizing necessary information, precious time is not wasted, helping to reduce response time by collecting these elements together in advance. With a proved and efficient model in place, the chaos typical in crisis situations is reduced and the event can be managed with less stress.

A fundamental point in each plan is the designation of a crisis team. The team members have to know their tasks and responsibilities during a crisis. Barton (2001) suggests that a crisis team should be formed by experts in different business areas: public relations, marketing, human resources, legal, operations and finance. Today, greater importance play also the social media managers in the organisation of a complete team. As it will discuss in detail in chapter 2, social media are probably the most effective communication

channel to deliver crisis messages (Coombs and Holladay 2014; Latonero and Shklovski 2011), and for this reason the experts in this field should be strongly considered. As emerged also with the scandal of Volkswagen's emissions lowering software, organisations are fiercely criticised if their social media messages seem to ignore a crisis or if there is an inconsistency in the response strategies in the different communication channels of the company (Hakim 2016b; Davies 2015). Clearly, the composition of the team varies, depending on the type of the crisis. Even if each crisis is unique and particular/decisive decisions can be taken only in the middle of the storm, the experts stress again the need for the practice and training of team members, emphasizing how it can be useful in improving their decision making ability during negative events (Mitroff 2000; Coombs 2007).

In the pre-crisis phase, also the communication strategy of the company should be anticipated in some way. Crisis managers can draft standard messages to adopt in the initial stage of a crisis through different channels, for instance in the form of statements by the CEO or other top managers, news releases or social media messages (Coombs 2014; Coombs and Holladay 2014). These templates are prepared messages with blank spots, to be completed and adjusted when key information is available. Usually, PR and legal personnel form and develop this kind of material (Coombs 2014). It is surely a useful method to save time and show readiness, because instead of creating and approving statements when a crisis hits, the team rapidly complete the prewritten ones with specific information making them available on traditional media and the internet.

1.4.2 – *Crisis response: its structure and the role of emotions*

When a crisis hits there is uncertainty and chaos. Peter Drucker, a great expert in the discipline of management, underlines how "managing in turbulent times" is a challenge (Drucker 2006). The first task for crisis managers is to ensure the structural strength of the company and its capacity to survive, adapting to the new context and recognising new opportunities to improve. The crisis response phase is for this reason fundamental.

Many authors have analysed how a crisis response should be managed. Public relations and a wise communication strategy, both internally and externally, play a critical role in this phase. At the beginning of a critical situation, the crisis team must focus its attention on the

delimitation of the affected areas of the organisation or the environment, preventing that it spreads to unaffected ones. The second objective is to limit its duration (Mitroff 2000; Coombs 2006). Communication deserves the highest attention during this period. Internally, the crisis team must be able to gather and study crisis relevant data in order to make decisions and inform constantly the employees (Condit 2014). Externally, it is necessary to keep stakeholders informed about the developments of the crisis and the actions undertaken to recover from it. The research is focused generally on three main aspects (Coombs 2007; Mitroff 2000; J. Bernstein 2011): 1) the form of the response; 2) its content; and 3) the impact of the emotions.

Starting from the form, practitioners and academic researchers suggests that the response should be quick, open and consistent.

Be quick means providing a response in the first hour, or however in a timely manner, after the explosion of the crisis (J. Bernstein 2011). The reason is that an organization should begin to "tell its side of the story" (Coombs 2007). In these chaotic situations, people want to know precisely what is happening and the possible consequences they could suffer, because many interests could be threatened. Crisis experts recognise that in most crisis situations an "information vacuum" is created, with the news media as a key source of initial crisis information (González-Herrero and Smith 2008). The media report crises very quickly, and with the advent of the Internet and social media, real-time information is diffused all over the world. What happens is that key stakeholders can hear about the crisis first from media reports, creating a difficult situation for the company. Here the crisis division must respond with readiness and decision. If the crisis team is not ready or willing to give initial crisis information to the media, some other people or entities will be, providing also inaccurate, wrong or even voluntary harmful data about the critical situation. With the words of Dr. Coombs, "[..] the information void can become filled with rumour and speculation, not facts" (Coombs 2007). An early response from the company usually does not contain complete indications about what is occurring, but ensures that the information transmitted to stakeholders is more accurate and in the direct interests of the organization. Considering such a limited response time for crisis managers and the pressure they have to bear, it is easy to evaluate the importance of the prevention and preparation phase in the organization of templates and prewritten messages that allow a ready response.

Both Lerbinger (1997) and Coombs (2014) argue how limited time and the need for speed in providing information increase risks of inaccuracies and mistakes, thus intensifying the damages caused by the crisis primarily in terms of reputation (Poma and Vecchiato 2012).

Remaining silent in the different communication channels in the crucial moment of the beginning of a crisis could be a fatal mistake. Silence equals lack of preparation, passivity and even guilt, exactly what a company should avoid (White 2011). Non-responding highlights that an organisation has no control over the situation, allowing other people to provide or manipulate information putting a company in serious risk (Coombs 2006). As we will see in chapter 3, Volkswagen has been criticised by PR practitioners for its passive response in the very initial phase of the scandal (Joshi and Hakim 2016; Smith and Parloff 2016)

Consistency means that the company has to provide a unified, coherent and clear response to its stakeholders and the media. In this perspective, the selection and training of adequate and reliable spokespersons assume a great value. The experts stress the importance for spokespersons to be prepared to talk and deal with the media (Barton 2001; J. Bernstein 2015; Coombs 2014). A common communication sin, which erodes deeply the consistency of the initial response, is answering "no comment." At the ears of the stakeholders, it confirms the guilt of the organisation. It is more convenient to admit that sure information is not available at the moment, promising that it will be reported when confirmed. Here, a related threat for organisations: not maintaining the promise to inform stakeholders and the media when the information is available (González-Herrero and Smith 2008; Coombs 2014). Failure to provide promised information damages the relationship in terms of trust and credibility. The consistency of the response is ensured when a company speaks "with one voice" (Coombs 2007), which does not mean that only one person is in charge of dealing with the media, but rather that the information given by official spokespersons is coordinated by the crisis team. For this reason, crisis managers have to maintain a deep internal communication line with all employees, sharing the same data to avoid inaccuracies or the leak of information (J. Bernstein 2015). Consistency is essential to convey the credibility of the response.

The last form characteristic of the response is to be open. As Coombs clarifies, openness regards the availability of the organisation to deal with the media (offline and online), an approach oriented to share information when available and, at the core, honesty (Coombs 2007). Obviously, the company can decide not to disclose all sensitive crisis related information, but to share only what is considered relevant to its stakeholders. Again, the crisis team has a great responsibility, because lack of honesty destroys the organization-stakeholder relationship, as well as company's reputation. And this means massive

financial losses, for instance in terms of reduced market share or lawsuits costs. Coming back to the emissions scandal at the centre of the thesis, consistency and openness appear not to be the most important characteristics in the response given by Volkswagen management after the crisis hits (Hakim 2016b; Joshi and Hakim 2016)

The second point under investigation is the content of the response. Coombs (2007) defines three sequential categories:
1) instructing information;
2) adjusting information;
3) reputation repair strategies.

Initially, it is necessary to give stakeholders instructing information. This means advices and instructions to people that are in danger, in order to ensure their safety. As said before, people are the first priority in any crisis, and in these situations, they need to know if the crisis will or could hit them directly. It is clear its necessity, for instance, in cases of environmental accidents or product defections (Sturges 1994). Even in situations where in danger there is the business continuity of the company, precise instructing information must be shared with stakeholders. They have to know how the crisis can affect business operations, and the moves of the organization to restore business as usual. For example, stakeholders must be informed about decisions concerning the rent of equipment or properties, the use of different facilities, or the dismissal/recruitment of new employees (Coombs 2007).

When causes and consequences of the crisis have been analysed and understood, a company should provide adjusting information. As Coombs underlines, it "helps stakeholders cope psychologically with the crisis" (Coombs 2007). In these stressful events, stakeholders are reassured when the company provide a complete description of what has happened and the preventive moves to avoid similar cases. Communicating the decisions taken to avert similar negative situations is defined as corrective action. In this way, it appears that the crisis is under control (Sturges 1994). As obvious, the earlier corrective action is presented in the response, the better for the company in terms of stakeholders' trust enforcement and reputation recovery. However, this could not be an easy task, because causes and consequences of the crisis could be difficult to understand and the process of designing corrective actions very long. Developing corrective actions before a good understanding of the reasons is not only dangerous and useless, but even

relevant on legal terms if managers speculations reveal wrong (Sturges 1994).

Besides presenting instructing and adjusting information to its stakeholders, a company should focus on how to limit the reputational damage and restore its image. In the next chapter, a broader part is dedicated to define what is company reputation and the related aspects regarding the Internet and social media presence. For now, it is useful to present how the theory has analysed the strong link between crisis communication and reputation repair.

The authors prove that communication (words and actions) affects how stakeholders judge the organization in crisis (Coombs and Holladay 1996; Sturges 1994; Drucker 2006). With the words of Lord Bell, Chairman and Co-Founder of Bell Pottinger, an important global PR and communication agency, "Perceptions are real. What you say about yourself, what others say about you, and how that affects people's perceptions has never been more important" (Bell Pottinger 2016). Researchers have identified many crisis response strategies. The Situational Crisis Communication Theory (SCCT) proposed by Coombs and other experts completes the identification of reputation repair strategies (Table 2, following page). It is important to explain that a company can follow more strategies at the same time, and that the process of reputation recovery can start even in the post crisis phase, as well as not being necessary for a company.

Table 2 – Reputation Repair Strategies

Denial Posture

Attacking the Accuser:	The crisis manager confronts the person or group that claims that a crisis exists. The response may include a threat to use force (e.g., a lawsuit) against the accuser.
Denial:	The crisis manager states that no crisis exists. The response may include explaining why there is no crisis.
Scapegoating:	Some other person or group outside of the organization is blamed for the crisis.

Diminishment Posture

Excusing:	The crisis manager tries to minimize the organization's responsibility for the crisis. The response can include denying any intention to do harm or claiming that the organization had no control of the events which led to the crisis.
Justification:	The crisis manager tries to minimize the perceived damage associated with the crisis. The response can include stating that there were no serious damages or injuries or claiming that the victims deserved what they received.

Rebuilding Posture

Compensation:	The organization provides money or other gifts to the victims.
Apology:	The crisis manager publicly states that the organization takes full responsibility for the crisis and asks forgiveness.

Bolstering Posture

Reminding:	The organization tells stakeholders about its past good works.
Ingratiation:	The organization praises stakeholders.
Victimage:	The organization explains how it too is a victim of the crisis.

Source: Coombs, W. Timothy. *Ongoing Crisis Communication: Planning, Managing, and Responding* (2nd Ed.). Los Angeles: Sage, 2007, p.140.

This list is useful if a company knows when to use a specific or a combination of response strategies according to the critical event that is occurring. A number of researchers in public relations, communication, and marketing have explained the link between crisis situation and appropriate crisis response, studying the attribution of responsibility that stakeholders give to the company at issue. All these studies converge in the so-called Attribution Theory (Coombs and Holladay 1996; Coombs 2007; Sturges 1994).

As highlighted in these researches, three main consequences in attributing relevant crisis responsibility to an organization have emerged: increased damage to reputation, reduction of purchase intentions and a higher negative word-of-mouth (Coombs 2007; Coombs & Holladay 2006).

The final aspect to cure in the crisis response is the role of emotions. Crises always generate strong emotions, in primis anxiety, anger or sympathy, as emerged in different studies (Cohn et al. 2000). Emotions influence deeply the reaction of the stakeholders towards the crisis and towards the company. In cases of natural disasters, for example, when a company has no or little responsibility for what has happened, sympathy and compassion are common emotions, increasing the support stakeholders are likely to show to the organisation. In cases of mismanagement or deception, angry stakeholders are likely to lose the trust in the company and to promote legal actions against it (Coombs and Holladay 2006). For this reason, a company should carefully evaluate the critical context, its responsibilities and the reactions of stakeholders in the creation of an effective communication strategy. In fact, emotions influence directly the type of information stakeholders pretend. Maintaining a regular and active communication with the consumer and the other stakeholders is necessary, both in good as well as bad times, to enforce the relationship and limit eventual reputation damages. As said, in times of crises stress and emotions play an important role, and the crisis team has to make its best in providing clear and easy-to-understand messages, in order to avoid misinformation or misinterpretation. Experts recognise that the ability to gather and evaluate information is reduced even up to 80% during particular emotional situations, such as crises (Coombs and Holladay 2014). Another aspect to consider when dealing with emotions is how to manage the relationship with the victims of the crisis. The term victims means all the people negatively affected in some way by the crisis (Coombs 2007). Crisis experts agree on the fact that the company should express concern and deep sympathy for the people hit by the negative event (J. Bernstein 2011; Condit 2014; Coombs 2014). However, the way a company express concern should be carefully studied, considering both the legal liabilities at stake, and the effectiveness/credibility of the message, if perceived just as a routine statement (Schweitzer, Brooks, and Galinsky 2015).

This topic is deeply interrelated with the most controversial response and reputation repair strategy proposed before: apology. A vast literature has explored in detail how to apologise and the related consequences (Schweitzer, Brooks, and Galinsky 2015; J. Bernstein 2011;

Wilkinson 2015). Here, the aspect I consider relevant is the distinction between a full or a partial apology. Full apology requires that a company recognises its responsibility, besides expressions of concern and explanations of corrective actions (Coombs 2007). The problem is that accepting the responsibility could lead to lose lawsuits and admit the guilt for the crisis. However, this approach can also have the positive effect of re-establishing a trusting and transparent relationship with the stakeholders, as in the case of GM automobiles recall (Wilkinson 2016; Schweitzer, Brooks, and Galinsky 2015). A partial apology, instead, is considered just as an expression of sympathy and regret, not carrying the same legal liabilities as in the prior case. Considering the *dieselgate,* Volkswagen's response has surely peculiar characteristics. While in the U.S it has admitted its responsibility concerning the use of a lowering emissions software to pass the strict environmental laws (and it has apologised with U.S. consumers), in Europe the German giant has not adopted the same strategy. It has not recognised its guilt because, according to Volkswagen, under European laws the system "is not a forbidden defeat device" (Hakim 2016a). In Chapter 3, Volkswagen's response startegy will be analysed in more detail.

1.4.3 – *Post-Crisis phase*

As noted earlier, the post-crisis phase has a triple function: analysing the effects suffered; continuing the process of recovery, above all in terms of reputation; learning from what happened, investigating the effectiveness of the responses during the crisis phase (J. Bernstein 2011).

In the post-crisis phase, the organisation should return to business as usual. The crisis is no more at the centre of the attention, but it could be not over, and it still requires consideration. As said, in this phase a complete analysis of the financial and non-financial consequences of the crisis is crucial, because it allows the company to have a clear image of its current situation and, above all, to provide this information to its stakeholders. This follow-up communication is important, because when a company promises to give additional information in the initial phases, it is necessary to respect the pact, or it risks eroding again trust and reputation (J. Bernstein 2015). The follow-up communications should include updates on the recovery process and the corrective actions that the company has applied, as well as regular developments about investigations and agreements related to the crisis. (Coombs 2007)

Furthermore, reputation repair strategies have to be continued or implemented during this phase, as anticipated in the previous paragraph. Crisis managers and academic experts recognise that a crisis situation should be an important learning opportunity (J. Bernstein 2015). A formal analysis of what moves proved to be efficient and effective, what instead was done wrong, and also what aspects could be done better in the next similar situation is a necessary activity for any crisis management team, in order to improve crisis preparedness. The organisation can improve in this way the full process of prevention, preparation and crisis response, if those lessons are effectively integrated into the whole crisis management system and constantly tested. However, many authors have found in their studies that companies do not give much importance to this post crisis learning activity, in primis because of "an inability to be honest about the self-assessment of a crisis effort" (Coombs 2014).

The most influent theories in crisis management have been discussed in this first chapter of the master thesis, in order to give a precise definition of the terms and topics relevant in this study. The next part focuses on the role of social media in the management of a critical situation. The chapter begins with a definition of what constitutes and affects the reputation and the web reputation of an organisation, considering specially the importance of the brand and the influence of the word-of-mouth. After a brief description of the most used social networks, this second part continues with the presentation of wide-accepted theories about social media crisis management and the derived best practices, above all on the aspect of crisis communication

Part 2. WEB REPUTATION & SOCIAL MEDIA

Reputation is a fundamental asset for companies. It takes time to build a strong one, but just one mistake could be enough to damage it consistently. In our current digital world, this appears to be even truer: transparency and immediate/real-time information flows are essential to meet the ever-increasing customer expectations. Ignoring what is happening on digital arenas is not possible.

Internet amplifies all phenomenon (Dallais 2014): every negative event, even small, can be found after minutes on Google research page, or on social networks. "And stigmas stay there for a long time", as Dallais comments. For this reasons, an active digital presence is for companies a must. It is necessary to communicate effectively, sharing messages that add value to the actions, better with the support of well-known and respected influencers, experts and bloggers. "Regularly "listening" to what is said about the association allows best to react immediately and to avoid being taken by surprise in case of a crisis", adds Dallais in her interesting article *E -Reputation: what is said about you on the Internet and why does it matter* (2014).

Focusing on the impact of social media, their dramatic increase in recent years has changed completely the discipline of crisis management. Using these online discussion platforms, companies have now the possibility to share, collect and organise information more efficiently and comprehensively. As Gonzalez-Herrero and Smith (2008) point out, social media are tools that have the ability to limit a crisis before it becomes unmanageable, but organisations have to consider also how these tools can aggravate a negative situation transforming it into a dangerous crisis. What many authors underline is that social media is a tool, and the same tool that can negatively impact on a company, can reveal its utility "by facilitating and accelerating the speed and breadth of communication, if properly utilised". (Chan 2013)

It is therefore clear how in our online era it becomes critical for every company to organise a social media crisis management plan, integrating specific presence and communication strategies on social media into a comprehensive crisis management plan. In the next paragraphs, all these topics will be discussed, to understand why social media are so important today in times of crisis and what organisations should do.

2.1 – *Company reputation and web reputation: the importance of a strong brand and the influence of the word-of-mouth*

In the first part of this study, it has been presented how to manage and protect reputation in times of crisis. But what constitutes a company's reputation and how it is influenced by digital applications and social networks?

There are different definitions of what reputation might consist of, but the fundamental aspect is that "[it] has to be earned" (Ingram 2016). As Toby Ingram explains, when an organisation establishes an image and a related philosophy in order to be positively perceived by the consumers, this positive reputation can only be obtained (and kept) depending on what the organisation does, its actions over time and the consistency between what is said and what happens in practice. In his relation *Corporate Reputation: definitions and representative history of literature* (2016), Ingram provides various general definitions of reputation. With the words of John Dalton, taken from his book *Managing Corporate Reputation* (Croft and Dalton 2003), "Reputation is the sum of values that stakeholders attribute to a company, based on their perception and interpretation of the image that the company communicates over time". The author suggests another explanation of the term, highlighting three elements that constitute corporate reputation, which he defines as "the reputational radar" (Ingram 2016). Briefly, these three elements are *brand reputation*, i.e. the public perception of a brand; *organisational reputation*, i.e. how consumers judge the company when its public reputation can differ from the reputation of the individual brands that it owns (for example for multinational enterprises); and *stakeholder reputation*, that is the consideration that direct stakeholders have about the company (or brand) in which they have an interest.

Apart from the general definitions of this term, a key point considering a company's reputation is to understand the process with which, over time, it is established. As before anticipated, it is the final stage of a process that starts with the definition of the philosophy and personality of the organisation, leading to the creation of a subsequent corporate identity and image, and enforced, or damaged, as a result of the actions undertaken. All these elements are also dependant on the corporate communication strategy that the company chooses. And in the digital era, a company's reputation is a very changing and variable concept. In fact, organisations must take care also of their web reputation.
The Web reputation, also called online or e-reputation, comprehends "all the contents and

comments about a person, a company, or an institution posted on the web" (Dallais 2014). Two types of contents affecting e-reputation can be identified:

- Official communication channels: websites and social networks accounts directly related to and managed by the organisation. This is part of the digital communication strategy of a company, which allows it to increase visibility, adapt its image, and defend or explain its choices, above all in crisis situations.
- Non manageable channels: everyone using the Internet has the possibility to express and share opinions or comments about a company posting them on websites, social networks or online blogs. These contents cannot be controlled, thus a constant monitoring on the web is necessary to verify what the opinion trends about your company are.

All these data directly affect the online reputation of an organisation appearing in search engines and on social networks or other webpages. E-reputation analysts usually classify it by the global tone, or sentiment, of its contents: positive, negative or neutral. As Danah Boyd, Microsoft Principal Researcher and social media scholar, explains in different articles (Boyd 2010; Boyd 2012), contents posted online on websites or on social networks have four peculiar characteristics. First, persistency, because information uploaded on the Web is in recorded form, and deleting it is a very difficult, if not impossible, task. Also because this information can be easily replicated on a myriad of web platforms. The third point is that it can be easily found through a search function, and consequently, point four, easily accessed by a potential vast and unintended audience.

In enforcing, damaging or protecting a company's reputation, the power of the brand and the influence of the word-of-mouth play both a significant role. A strong brand is important, because it contains both emotional and functional values that connect the company with its customers (De Chernatony 1999). Organisations have the objective to build a powerful and coherent corporate identity, which is a component of branding, highlighting distinct values that become associated with the brand. Of course, having an established and recognised brand allows the acquisition of favourable and persistent positions in the market. Employees are also part of the branding strategy: how consumers perceive the organisation's brand depends also on the attitudes, values and actions of the personnel (De Chernatony 1999).

There must be correspondence between company's values and stakeholders' expectations of the brand and the whole organisation have to work to ensure this. Managers not only have to focus on brand image, whose perception by consumers can change during the time and that the company can modify following its strategy, but they should strongly concentrate on reputation, a more valuable asset that derives from an organisation's historical results or failures (Harris and De Chernatony 2001). Brand image and reputation are the foundations of a company, and they are influenced by the actions, communication strategies and symbols transmitted by the organisation (De Chernatony 1999).

Word-of-mouth (WOM), according to the definition given by Investopedia, "is when a consumer's interest for a company's product or service is reflected in their daily dialogs" (Investopedia 2010). Companies can influence this transmission of information between the consumers through specific marketing activities (Word-of-mouth marketing), as for example buzz, viral, blog, emotional and social media marketing, but surely the reputation that the company has between its consumer base is the primary source in affecting word-of-mouth (Dellarocas 2003). As different authors have explained, the word-of-mouth about a firm can be positive or negative, and it plays an important role for what concerns buying decisions and in shaping consumers' behaviours and preferences (Dellarocas 2003). Word-of-mouth is in general hard to monitor for organisations, but with the advent of social networks, this activity is facilitated thanks to the easiness in finding specific contents and the rapidity in exchanging information (Dellarocas 2003). As said, it is necessary for organisations to monitor social media discussions and trends, considering the vast amount of data at their disposal and the real time feedback that they can get by their clients.

What are the reasons that generate word-of-mouth? Authors have tried to answer to this question, suggesting that WOM can arise for different reasons, differentiating its positive or negative nature. Henning-Thurau et al. (2004) suggest that negative WOM is generated when a customer does not get what expected, sharing negative feelings, anger or frustration with other clients and also helping them to not get the same problems. Dellarocas (2003) highlights another circumstance, i.e. when people use fake identities to give false information and get a negative effect on a company's brand and reputation. As some researches has shown, in fact, people seems to trust what they read online, not focusing on the source of the information (Dellarocas 2010). Negative WOM arises also because complaining online is direct, convenient and with a low risk (Hennig-Thurau et al. 2004). According to the experts, positive word-of-mouth is generated when consumers

want to share good news and experiences about a product or a company, to seek advice from others or to help others in purchase decisions, or to give advices to the organisations (Hennig-Thurau et al. 2004).

The e-reputation of a company is also influenced by the way information is transformed online. Johnson, Regan and Wayland, in their paper "*Campaign Disclosure, Privacy and Transparency*" (2011), use the "house of mirrors" analogy to explain how the Internet can distort information, just like a house of mirrors distorts images. "A house of mirrors is full of reflection, refraction, multiplication of images, and unpredictable perspectives. […] It is a complex of imagery, with bouncing, highlighting, and shading of images that produce a surprising experience" (Johnson, Regan, and Wayland 2011). In the online environment, the term *bouncing* indicates when information is shared for one reason but it is then taken and used for another. Images, posts or comments published on social networks, for example, can be easily accessed by the other users, and if they have negative intentions, these contents could be manipulated or voluntarily misinterpreted to damage the image and the reputation of an individual/organisation. *Highlighting and shading* refers to the fact that information can assume a higher or lower value depending on the context, affecting even in this way an entity's reputation. For instance, information that appears in the first positions in search results is surely "highlighted", but it is not sure if it is correct or false. The same holds true for the "shaded" information that appears in the last positions or in the following pages of the search results. These insights are confirmed by some studies (Chitika 2013), which show how users tend to focus their attention at the top of the page, and to click almost exclusively on links that are present on the first page of search results: the percentage of Google traffic for the first page of the search results is over 90%. Pre-selecting information in this way, as it is easy to understand, can have a negative impact on a company's reputation, and explains how fundamental is for companies to cure SEO and SEM activities.

Showing the interdependent relations between reputation, brand image and word-of-mouth, I wanted to underline the extreme importance and difficulty for companies in managing these aspects, because, as already said many times, a misstep can cause a chain reaction difficult to fix. A recent example is of course the emissions scandal that has involved Volkswagen Group in the last months. The 2016 Harris Pool Report on the 100 most visible companies in the U.S. presents a difficult situation for the German automaker in managing its reputation. Volkswagen's "appeal" declined dramatically, "dropping 20.5

points overall from a "very good" (75.21) score in 2015 to a "very poor" (54.75) rating in 2016", on a reputational scale from 0 to 100 (The Harris Pool 2016b). It was the only company to receive the lowest rating, with a heavy impact also on Emotional Appeal (it includes attributes of trust, admiration and respect, with a loss of 25 points from 2015) and on Social Responsibility (-20 points, concerning environmental and community responsibility). The spread of negative word-of-mouth, especially on social networks, has surely contributed to this severe reputational damage (Deering 2015), even if the power and the global fame of a company like Volkswagen and its brands has surely cushioned the negative effects that could have been even worse (BrandBastion 2015). The Harris Pool's study has also investigated the main causes of reputation losses, surveying a sample of more than 23.000 American customers. According to the Harris Poll's report, "the biggest risks to corporate reputation are lying or misrepresenting facts about a product or service, or intentional wrongdoing or illegal actions by corporate leaders" (The Harris Pool 2016b), with both a percentage of 80% of the interviewed. This confirms surely the great impact of the *dieselgate* on the American market, and how it has been perceived as an illegal fraud. Other major risks to reputation damage, as indicated in the report, include security breaches (74%), product defections damaging people safety (66%) and unfair workplace conditions (64%).

With the increasingly dominant use of social networks, the web reputation has become a required parameter to take into account for a wisely management of an organisation and its products/services. In fact, negative opinions, comments or misinterpreted messages posted by anonymous users, by customers and even by own employees on the internet can harm the reputation of a company, destroying its chances to acquire new prospects and potential partners. The next paragraph will therefore discuss the characteristics of the most used social media.

2.2 - *Social media landscape and characteristics: their importance for organisations*

Following the definitions proposed by the experts, social media can be defined as "a form of new media that facilitates social interaction and communication through the use of online internet-based platforms" (Chan 2013). As Coombs adds, the term *social media* comprehends "the various electronic tools, technologies, and applications that facilitate interactive communication and content exchange", in which the user plays not only the passive role of being part of the audience, but he is also active in producing and sharing contents (Coombs 2014). The Internet, and its web platforms, allow everyone to share comments and experiences, and for businesses, as discussed, this can reveal both a great opportunity to exploit, but also a dramatic danger if not managed well.

In his paper "*The role of Social Media in crisis preparedness, response and recovery*" (2013), Chan presents in a clear way what differentiates the new social media to traditional one. Online social media tools can in fact overcome the "barriers" of traditional forms of media, consisting in a limited reach of the information shared due to geographical, physical and time restrictions that characterise this type of media. In particular, the author presents the five key features of online social media:

1- Collectivity: social media is collective because it allows the connection of people all over the world and at the same time utilising common platforms, fostering the development of a multitude of online communities with similar interests;

2- Clarity: content published on social media is visible and recognisable, and members tend to pay a lot of attention to activities, comments and posts of the other users;

3- Connectivity: through the sharing of web links, social media can connect users to other resources and webpages in a very rapid and effective way. This characteristic is exploited above all by companies through SEO and SEM activities, which permit for example to direct potential customers to the company's website and to increase the volume of sales or the rate of conversion.

4- Collaboration: thanks to the direct, rapid and easy communication between users that characterise most of these web platforms, people can contribute in areas they are interested in, by providing information and feedback. Even in this case,

companies can exploit this feature launching collaborative projects with their online users or open sourcing and developing their products/services at a lower cost.

5- Completeness: the term identifies the ability of social media in keeping and recording all contributions and contents, so that all users can view and share them over time.

The term *social media* groups various online tools and platforms. Boyd (2010), Chan (2013) and Coombs (2014) have categorised in their articles these different typologies, which are here explained:
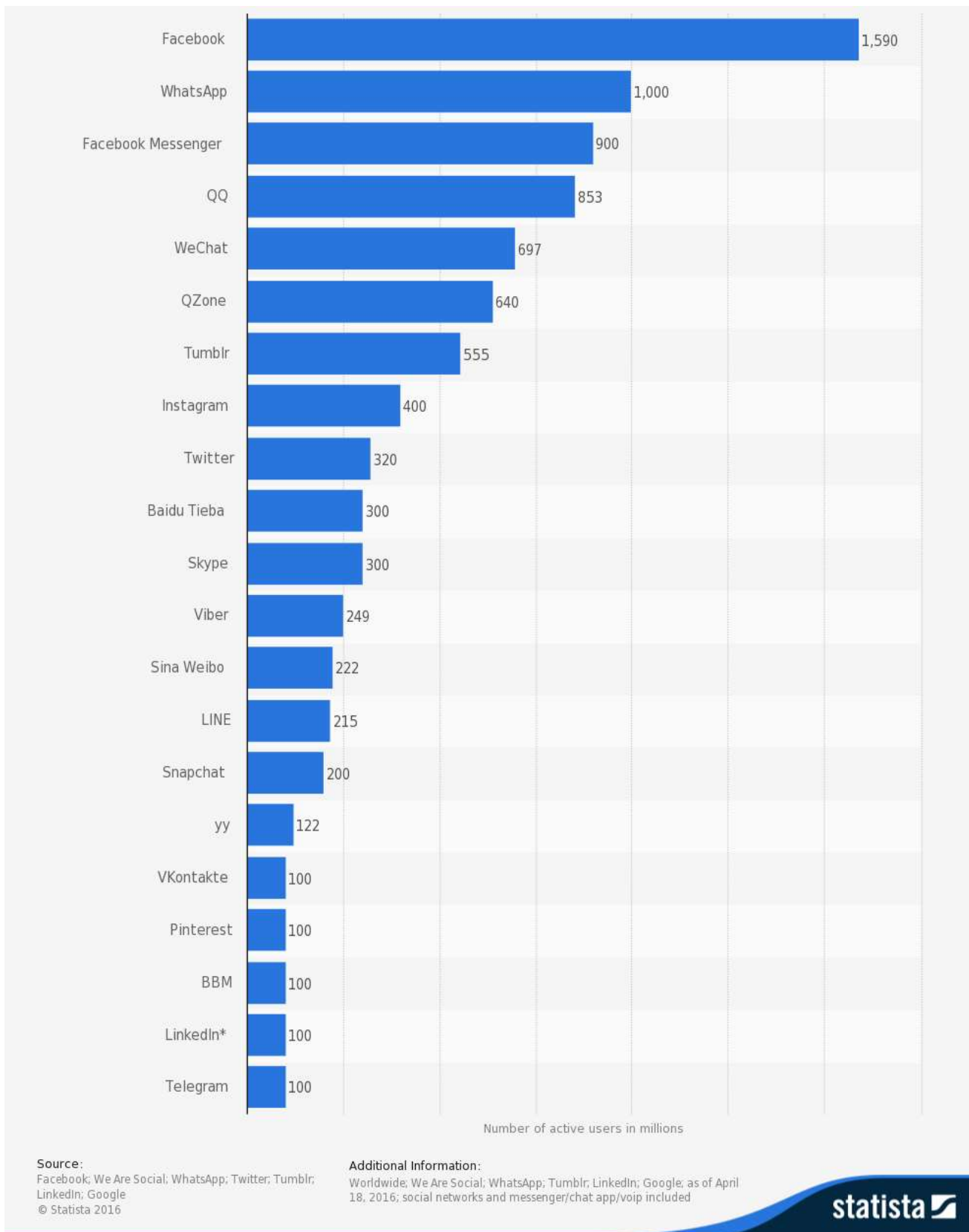
- Social networks: surely the fastest growing phenomenon on the Internet in the last decade, with billions of active users worldwide, social networks are websites in which people create their own personal account, communicating and sharing contents with other users (Chan 2013). A social networking site is typically a network started by a small number of people that grows by sending invitations to others to join. On these online networks, a user can create and develop his list of friends, which are either social or professional contacts, and follow his specific interests and hobbies. According to Boyd (2010), social networks are similar to the other typologies of social platforms and online communities that allow computer-mediated communication, but they have peculiar characteristics. What differentiates social networks is the possibility for users "to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (Boyd 2010). Different social networks have their own different features and functionalities, and among the most used platforms we can find of course Facebook, Twitter, Google+ and LinkedIn. Just to understand the incredible social and business relevance of social networks, Facebook, founded in 2004 and today the undiscussed market leader, counts 1.13 billion daily active users on average for June 2016, of which approximately 84.5% are outside the US and Canada (Facebook, Inc. 2016);

- Content communities: they are online communities, similar to social networks, whose primary function is the sharing of various types of content, such as photos, audio and videos. YouTube, Instagram, Pinterest and Snapchat can be considered

part of this category;

- Collaborative projects: Wikipedia is the best example to define collaborative projects. They are open-source and usually free-to-access databases in which users can add and modify contents such as information and images.

- Blogs: blogs are personal websites designed primarily as a container of text (e.g. as a diary, an independent journal or a discussion site), which can be updated with different multimedia contents by the single user in real time thanks to a specific software. Tumblr is the most used microblogging and social networking platform, with more than 550 million monthly active users worldwide with their personal blog site (Statista 2016).

- Bookmarking sites: they are websites in which people categorise, share and search links on the internet through the practice of "folksonomy" (Chan 2013). On websites like digg.com and reddit.com, people can tag, classify and share content, and the visibility of the contents improve as their sharing increases.

- Social reviews: this final category comprehends websites in which users can search, rate and share recommendations and judgements usually about commercial activities like restaurants, hotels etc. (e.g., TripAdvisor, Yelp!), but also about companies (e.g. PagineGialle in Italy).

With the constant development of new applications, features and functionalities, however, there is not a clear differentiation between all these categories. In a recent analysis conducted by Statista, the monthly active users as of April 2016 for the most important social media (and chat applications) have been calculated. In picture 2 the results: Facebook consolidates its leadership counting 1,6 billion monthly active users, while Twitter, the social network I selected to develop the data analysis on the effects of the *dieselgate* on Volkswagen's web reputation that will be discussed in chapter 3, counts more than 320 million users on a monthly basis.

Picture 2 - Leading social media (and chat applications) worldwide as of April 2016, ranked by number of active users (in millions)

Platform	Number of active users in millions
Facebook	1,590
WhatsApp	1,000
Facebook Messenger	900
QQ	853
WeChat	697
QZone	640
Tumblr	555
Instagram	400
Twitter	320
Baidu Tieba	300
Skype	300
Viber	249
Sina Weibo	222
LINE	215
Snapchat	200
yy	122
VKontakte	100
Pinterest	100
BBM	100
LinkedIn*	100
Telegram	100

Number of active users in millions

Source:
Facebook; We Are Social; WhatsApp; Twitter; Tumblr; LinkedIn; Google
© Statista 2016

Additional Information:
Worldwide; We Are Social; WhatsApp; Tumblr; LinkedIn; Google; as of April 18, 2016; social networks and messenger/chat app/voip included

statista

Source: Statista. 2016. 'Global Social Media Ranking 2016 | Statistic'. Statista. April.
http://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/.

As these numbers suggest, the impact of social media in collecting and sharing instantaneous information is enormous, and with the constant improvements of the mobile technology, it is even more intensified. Social media gives all the people the power to share what they see, what they perceive or what they believe. This influence, again, must be considered with great attention, considering how social media platforms could help or hamper organizations' crisis communications (Holmes 2011). Online networks are useful in supplying stakeholders with a timely resource to make sense of a crisis, and by allowing a direct communication channel to share appropriate information quickly to consumers and the other stakeholders. On the other side, social media can put in danger the effectiveness of organisations' crisis communications strategies, by spreading misinformation and speculation. In fact, not everyone using social media could have sincere intentions, using it to damage an organization and its reputation to his own advantage.

Crises, as discussed in the previous chapter, are unique and complex in their nature, have variable and unforeseeable effects and can last for a long time, or just for some days. As Chan (2013) points out, however, organisations' ability to respond to and overcome difficult moments can be improved by exploiting the specific characteristics of the social media tools. For instance, social networks and blogs can prove to be very useful in the first moments of a crisis, helping crisis managers to identify what is its source and magnitude and to provide a rapid and visible message to the affected stakeholders. Crisis managers can then monitor the trends of discussion on bookmarking sites, when relevant contents are tagged and evaluated by users' opinions, managing in this way to gather and assess information better, and to respond to on-going developments knowing the requests of the stakeholders. In the same way, crisis managers can monitor content communities and social review sites, identifying relevant concerns and themes expressed online as well as key contributors.

Knowing the features and typologies that define social media, the next step is discussing how online networks have deeply changed crisis management strategies and how they can be effectively managed in each different crisis phase.

2.3 - *Crisis management & social media*

Resuming the considerations made in the first chapter of the thesis, the majority of academic researchers and PR experts indicate that crisis management can be divided into three phases: pre-crisis, crisis response, and crisis recovery.

During the pre-crisis phase, the focus is on creating a comprehensive crisis management plan, analysing major risk factors but also considering the less probable negative scenarios (Mitroff 2000). The creation and testing of a dedicated and multitasking crisis management team is fundamental. The crisis response, above all in its initial phase, must be quick, open and consistent. The company has to provide instructing and adjusting information, to guarantee stakeholders' safety and to transmit appropriate updates to them in order to face and limit the crisis (Coombs 2014). In this phase, it assumes a great importance for organization to evaluate in a timely manner the crisis typology, in order to implement an adequate reputation repair strategy. When the crisis has been stemmed and it has lost media attention, the crisis recovery phase requires longer term planning and modifications, to return to business as usual. The post-crisis phase has a triple function: measuring the effects suffered; continuing the process of reputation recovery; better preparing for the next crisis, learning from what done in the previous situation (Poma and Vecchiato 2012).

Across these three stages, as Chan (2013) clearly explains, social media tools reveal their utility in disseminating information, providing platforms for planning, training and collaborative problem solving, as well as gathering and measuring data over time. Social media constitutes a direct communication channel for organisations with their clients and stakeholders, and it is an effective means to share reliable information to the targeted group of interest in times of crisis. However, the effectiveness depends on the reach and characteristics of the chosen social media platform, as well as on the characteristics of the target group (in terms of technological knowledge, education, culture etc.). Being online platforms that connect people, organisations and institutions worldwide, social media tools are ideal in planning and training for crises, for example analysing what are the risk factors and the company vulnerabilities that emerge by customers' online comments or judgments. In this way adequate personnel training, scenario planning and collaborative problem solving measures with the stakeholders can be successfully organised. Especially during a crisis, a company has to exploit the indications and the

criticisms from its customers, and try to correct the identified critical issues. This crowdsourcing activity facilitated by social media allows not only the integration of various streams of information all over the world, which permit to fill the usual information gaps during a crisis, but it enables also to gather a lot of precious data, whose analysis and aggregation is a fundamental activity in the recovery phase of a crisis.

2.3.1 - *How to integrate social media in each crisis phase*

Social media has deeply changed the discipline of crisis management. In each crisis phase they can be effectively integrated, facilitating the process of prevention, response and recovery.

Before a crisis occurs, a company should establish a comprehensive crisis management team, as we have previously discussed. However, considering the great relevance of social media and its users, it is necessary to establish a dedicated social media crisis team, responsible for all the aspects regarding response and data analysis on these platforms. In this phase, all organisational details must be set up. For example, as Boucher (2016) suggests, a dedicated Slack platform or intranet site are essential to guarantee real-time communication between all the members of the social media team. In addition, hierarchy and contents must be clarified: what kind of posts/contents can the social media team distribute? Pre drafted posts must be prepared in advance, ready to use in negative situations. The approval system is another key point to be decided before a crisis hits, reducing time and showing readiness when it is needed.

Considering that a company may have more than one Facebook page, different Twitter accounts and other online platforms, more than one person should be in charge of responding to posts and analyse data from different sources. Planning accordingly and sharing constantly the information with the entire team is fundamental to maintain credibility during a crisis. A good practice, as indicated by different PR experts (Boucher 2016; J. Bernstein 2011), is the selection of a social media management tool, e.g. Hootsuite, or Everypost. These web applications are able to monitor different social media at the same time, allowing the real-time analysis of the sentiment, trends, influencers and other indicators related to a company's brand. Especially at the onset of crisis, when initial, fragmented information spreads rapidly in the Internet and on social networks, monitoring the Web is essential, to provide a timely response and give the company's position.
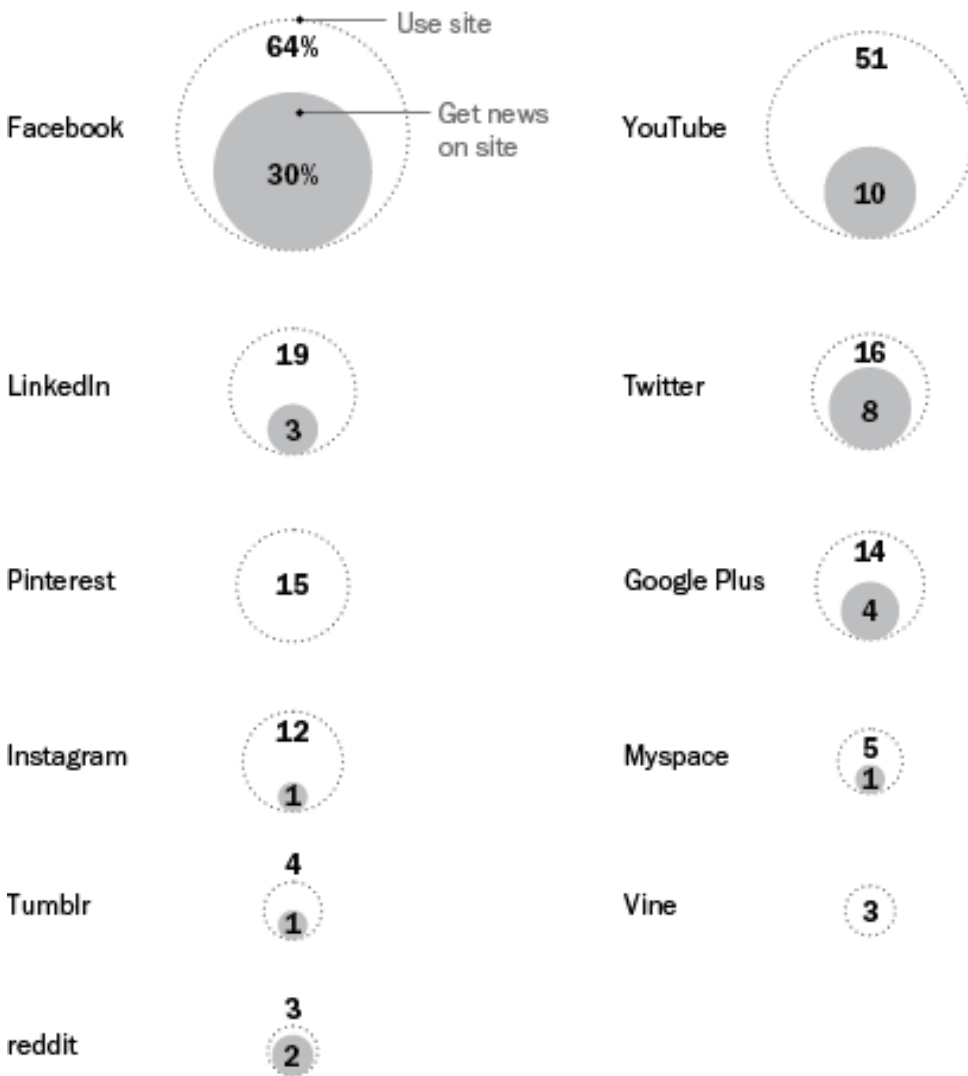
In the first phases of a crisis, discussions in the Internet about the problem are usually quite dynamic and often inaccurate. Anyone impacted looks for answers as soon as possible. This is why the company's spokespersons and the social media team should join the debates promptly, before others start to talk on media and social media without the facts. Dealing both with positive and negative criticism in a constructive manner is essential, above all on social media platforms. As shown in a recent research conducted by Holcomb, Gottfried and Mitchell (2013), a considerable percentage of American Internet users consider social media as the primary source to get their news, including information about companies and the associated events, and, very important, the comments of other users. For this reason, it appears reasonable to state that a segment of customers visits the company's social media accounts to get information about the organisation, and in crisis situations the percentage can increase a lot. Looking at the statistics (Pic. 3, following page), 64% of U.S. adults use Facebook, but the most significant fact is that 30% of American adults get news from this social network. The percentage declines, but remains important, if we look at Twitter, with 16% of U.S. adults who have a Twitter profile, and 8% of them using it as a principal source of information.

Considering these facts, it is clear how fundamental, but difficult, it is for enterprises to share reliable information and to defend their reputation during crises. A company should have a presence on all online channels where its customers are, because it is impossible to foresee on which social networking site or blog potential damaging information may appear. As González-Herrero and Smith (2008) recognise, an organisation should show readiness also on the online platforms where no marketing activities have been organised. Bernstein (2015), Poma and Vecchiato (2012) and Coombs (2014) underline in their papers how the best strategy in dealing with damaging information, also on social media, is honesty and capability to accept responsibility for the events. The worst, usually, appears to be the avoidance strategy, or denying all accusations not providing adequate replies. Blocking or removing negative posts on a social network, for example, is not a good solution. Stakeholders become angry, and their respect rapidly vanishes. Internet communities, having a real-time, direct contact with organisations, do not want to receive standard and unemotional company's statements, but they require that the organisation shows sincere interest about stakeholders' consequences and that it works to change the situation. In developing a crisis management strategy, with a specific eye on the social media environment, a company should for this reason take in consideration both its interests (finances, reputation, investments), as well as the ones of its stakeholders.

Picture 3 – Social media as a principal source of information

Social Media as a Pathway to News: Facebook Leads the Way

Percent of U.S. adults who use each social networking site & percent of U.S. adults who get news from each social networking site

Use site — 64%
Facebook
Get news on site — 30%

YouTube 51 / 10

LinkedIn 19 / 3
Twitter 16 / 8

Pinterest 15
Google Plus 14 / 4

Instagram 12 / 1
Myspace 5 / 1

Tumblr 4 / 1
Vine 3

reddit 3 / 2

Note: The percent of U.S. adults who get news on Pinterest and Vine each amount to less than one percent.

Aug. 21-Sept. 2, 2013

PEW RESEARCH CENTER

Source: Holcomb, Jesse, Jeffrey Gottfried, and Amy Mitchell. 2013. 'News Use Across Social Media Platforms'. Pew Research Center's Journalism Project. November 14.

According to Baer and Naslund (2011), for an effective crisis response through social media a sequential procedure must be considered. The first step is to confirm on these platforms that there is a crisis condition, trying surely to minimise the importance of the

events and sharing a common message through the different online channels. Explaining that the situation is under analysis and promising timely updates to the stakeholders, a company shows awareness and proactivity to take the necessary measures. Remaining silent would be a fatal mistake: on social media, misinformation and negative sentiments towards the organisation would spread out of control. An effective response must show the concern of the company in relation to the issue and the stakeholders' interests.

The authors suggest also responding initially via the same channels in which the crisis has emerged. If it has initiated on Twitter, the initial response should be done on the same social network, focusing on the users/sources that have posted negative information and dealing directly with them. Afterwards, considering how rapidly information is shared on social media, a comprehensive response via the other online communications channels is usually required. It is important to notice, however, that not all social mentions or comments require a response: in most cases, they could be offensive or provocative online posts, which a company must however monitor carefully (Boucher 2016).
A good practice, if the crisis is serious, is to suspend the current marketing activities on social media: all automated posts should be stopped, because sensitivity towards clients and stakeholders must be ensured. The message that must be conveyed is that at the first place there is the resolution of the problem, for the company and for its audience.

To provide reliable and precise information to its interested users, a company must set up an official dedicated portal or website regarding the management and resolution of the crisis, to which all followers on social media have to be redirected. The creation of a specific section dedicated to the problem into the corporate website, with proper FAQ pages and contacts, enables the company to answer to the different necessities of different stakeholders. In this protected environment, public official statements and positions of the organisation about the situation can be transmitted and updated over time, correcting eventual false or incorrect information given by other sources. Enabling feedbacks by the page visitors, or only by certain stakeholders, the company can have a direct, but controlled contact with the clients, while on social media the interferences and the negative word-of-mouth are difficult to limit (Baer and Naslund 2011). The FAQ page is useful because it systematizes important information about the crisis, and helps part of the customers to find rapidly a solution to their problems. The FAQ should contain details on the reasons that led to the crisis, how the situation was and will be managed, what the affected stakeholders have to do to safeguard their interest and what measures have been

decided to prevent the situation from occurring again.

Baer and Naslund, like other authors (J. Bernstein 2015; Coombs and Holladay 2014), recognise how creating a place for dialog and discussion about the crisis is beneficial. If an organisation does not provide a platform for the exchange of opinions and evaluations, the discussion will consequently transfer to other places, outside its control. If the discussion is kept in one place, the monitoring is surely facilitated. For the whole duration of the negative period, even internal communication is fundamental. Keeping the social media crises team members informed about the developments of the situation enables them to provide reliable and consistent information about the crisis, speaking "with one voice" (Coombs 2014).

When a crisis is finally under control and the discussions on social media platforms have been dammed, a continuous monitoring of the trends and topics related to the crisis and the organization is however advisable, through the useful social media management tools (Boucher 2016). In addition, as indicated also in the first chapter, in the post-crisis phase an evaluation of the effectiveness of the response plan and an analysis of how the process can be improved is very relevant. In fact, companies can learn important lessons from a crisis situation, and social media, thanks to their characteristics, can facilitate this. For example, the traffic volume on company's profiles on social networks, the most influential users and the trend topics of major relevance during the crisis period can be easily accessed and evaluated (Baer and Naslund 2011). In the next paragraph, it will be discussed what are the relevant data to analyse through social media.

Coombs (2014) and Boyd (2010) have highlighted another key point when considering social media in the management of a crisis: the specific types of public of this platforms. According to Coombs, three different types of publics use social media channels: there are the "influential social media creators", or "influencers", who are active in creating and sharing crisis information on social media; they are usually press agencies or newspapers. The "social media followers" get the news and updates directly from the influential social media creator, increasing the rapid diffusion of the information. The third group is composed of the "social media inactive", users who get the information from the word-of-mouth of the other social media followers, or from traditional media that report the news from the influencers.

Boyd identifies a more detailed classification of users playing different roles while a crisis unfolds in the social media sphere. The "activists" share information through different blogs, websites or internet accounts to their friend users, or on other platforms frequented by people interested in the matter. The "attentive observers" are users deeply interested in understanding the situation and finding out even the smallest details, usually because they are personally involved in the consequences of the event; for this reason they are active in asking questions and in following constantly the developments of the crisis. The so-called "brand defenders" can be clients as well as normal users who try to defend a company in which they believe and respect, moderating discussions on social platforms and not judging before the facts are known. On the other side, the "critics" express their dissatisfaction and anger towards an organisation in relation to the crisis that has been caused; most of them, as the author has noticed, do not criticise the company over time, limiting to post their malcontent once and then not entering the discussion anymore. Eventually, the "competitors", rival companies that try to take the opportunity to discredit the organisation in crisis and to erode its customer base.

Crisis managers and social media teams should consider the value and characteristics of these types of users in the crisis communication response, providing differentiate and tailor-made messages according to their needs. The effectiveness of the response can in this way increase.

2.3.2 - *Analysing a crisis' data on social media: relevant parameters*

As it has been discussed in the previous pages, a crisis can explode at any time. With the exponential growth of social media and a 24-hour news cycle, the speed and the scale with which a crisis can spread is always greater. Inevitably, the management of a crisis situation has become even more difficult, especially without the aid of special tools able to monitor what is happening online. By utilising an appropriate social media management tool, and focusing on specific parameters of interest, crisis teams can better manage a potential critical issue, and safeguarding the company's web reputation (J. Bernstein 2011).

Analysing the data from social media is particularly useful in two phases: problem identification and crisis response.

Understanding the sentiment towards your company and brand is the first step to detect a potential crisis. The sentiment, as said, can be positive, neutral or negative, and it is derived by the computational analysis of the language, text and contents posted on social media and mentioning your organisation, with the aid of proper programmes and functions (e.g., R is a valuable instrument with lots of packages to process and analyse textual data) (Arnold and Tilton 2015). By observing the sentiment, it is possible to determine what percentage of mentions of your company or brand is positive, negative or neutral. Extraordinary peaks of negativity, and even neutrality, should be treated with caution as they may be the first indicators an imminent crisis. Comparing the volume of the total mentions to the volume of negativity of the same mentions is a good way to understand the relevance of the problem that you will potentially face.

The second step is analysing the online diffusion of the problem. Understanding what are the social media, websites or other online platforms in which the discussions related to your company have been higher is useful because it delimits the areas in which it is necessary to act. Subsequently, highlighting what are the main themes of discussion that have emerged. By knowing the places on which the conversations take place and the topics discussed, it is possible to intercept and check one by one the various received mentions, to interact directly with the authors, and to limit or adjust the negative comments expressed.

Especially for international brands, it is helpful to know the geographical areas in which the crisis spreads mainly. By exploiting the spatial-temporal characteristics of social data, it is easy to determine the country or even the region of origin of the mention, in order to clarify if it is a local problem or if it is diffused worldwide, and to act accordingly with specific measures.

During the crisis response phase, the analysis must focus its attention on the reasons and ways in which the crisis spreads. It is important to monitor if the level of mentions and negativity increases, decreases or remains stable compared to the previous period, to have a clear view of the effectiveness of the actions taken. As shown in Picture 4, a social media crisis usually spreads rapidly. The interest provoked by the events that led to the crisis increases dramatically, but it usually lasts for a relatively short time. The duration varies depending on the type and severity of the crisis (Chwiałkowska 2012). Thus, when negative comments appear, a company should react readily, before dangerous information

is shared damaging its reputation online.

Picture 4 – Variation of the interest in content appearing online
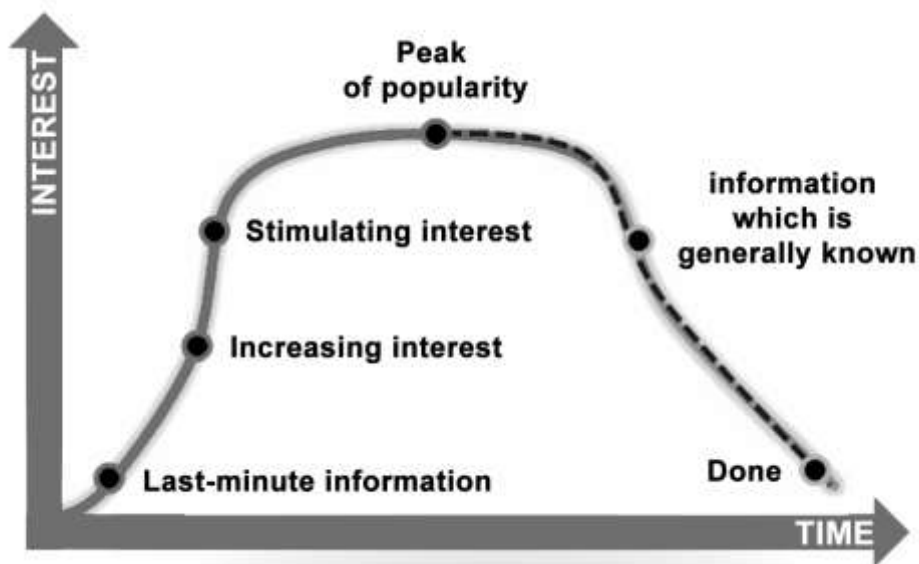
To get a clearer picture of the situation, it is necessary to monitor the sentiment and the performance of each individual social media and web source, comparing the current situation with the initial phases of the crisis. In fact, it is possible that on some platforms, for various reasons, the crisis could be more difficult to eradicate.

Understanding who are the users who mention your company the most is another useful practice. By searching the most active and influential users on the various social media who talk about your organisation, you can also extract the sentiment of their interventions, and determine if these users are defenders or critics. Then, a proper communication strategy to deal with them can be organised, recognising that the cooperation with the influencers is a very important part of the recovery strategy in terms of credibility. Bernstein (2011) recognises how users tend to consider more the opinions of the influencers they follow, because of similar interests and trust, even if the information shared is not correct.

As we have seen, social media provides a unique set of evaluative data during and after a crisis. The fundamental advantage is that crisis managers can determine in real time how stakeholders react to the negative events and to the measures implemented by the organisation. Of course, there are limitations when considering the social media response

data, because only the comments and contents posted by users willing to be active in the discussion are included, potentially providing a biased view of stakeholders' reactions.

Social media interactions have been used to analyse how stakeholders have reacted to a crisis. Following a similar reasoning and focusing on some parameters previously discussed, I have conducted an analysis on the web reputation of Volkswagen on Twitter after the explosion of the *dieselgate*. Considering a limited time period of around forty days (from 18.09 to 26.10.2015) and more than 115.000 tweets, I have studied how the users reacted to the scandal, focusing on the frequency of the published tweets, the keywords that emerge and their variation in the period, the general sentiment of the tweets and its variation, and also the emotions that users expressed. In the next chapter 3, then, the discussion will be focused on explaining in detail the dynamics of the emissions scandal and on the response, above all on social media, of the German company. In the last Part 4, the results of the research will be presented.

Part 3. CASE STUDY: VOLKSWAGEN'S EMISSIONS SCANDAL

3.1 - *The scandal explained: the most important events and developments*

The 18th September 2015 can be considered the start date of the so-called *dieselgate*. On that day, the U.S. Environmental Protection Agency (EPA) issued a first notice of violation of the *Clean Air Act* to the Volkswagen Group, and it was just the beginning for the German company in facing the worst scandal of its entire history (OAR US EPA 2016b). The accusation for Volkswagen regarded the use of a "defeat device" on diesel engines to lower nitrogen oxide (NOx) emissions levels during test conditions. According to the EPA, a defeat device "bypasses, defeats, or renders inoperative a required element of the vehicle's emission control system". Volkswagen, as emerged, intentionally set up a specific software on turbocharged direct injection (TDI) diesel engines able to activate certain emissions controls only during laboratory testing. In this way, NOx emission level could meet US standards, but during real-world driving conditions it was up to 40 times higher (OAR US EPA 2016c; Russell et al. 2015). This first notice of violation regarded 499,000 VW vehicles sold in the United States, during model years 2009 through 2015 equipped with a 2.0 litre diesel engine (OAR US EPA 2016b).

Even if the scandal erupted dramatically on worldwide media on September 2015, the details at the heart of the news have been available since May 2014, a year and a half before its explosion. The International Council on Clean Transportation (ICCT) commissioned a study on emissions differences between European and American models of autos. The ICCT asked the West Virginia Center for Alternative Fuels, Engines and Emissions to study the emissions of three diesel vehicles under different U.S. driving conditions. The three autos, kept anonymous in the study, were a 2011 VW Jetta, a 2012 VW Passat and a BMW X5. The team was composed by researchers Gregory Thompson, Daniel Carder, Marc Besch, Arvind Thiruvengadam, and Hemanth Kappanna (Jaffe 2015). The on-the-road testing data have been collected using a portable emissions measurement system (PEMS) invented by an EPA engineer and installed on each vehicle. The results of the tests (Thompson et al. 2014, Picture 5) showed how NOx emissions for the Jetta (Vehicle A) were, on average, 15 to 35 times higher than the EPA standards, represented by the green line in the picture, and those for the Passat (Vehicle B) 5 to 20 times higher. The BMW maintained acceptable emissions levels and passed the test (Jaffe 2015).

Picture 5 – On-the-road testing results showing higher NOx emissions levels for vehicle A (VW Jetta) and B (VW Passat)
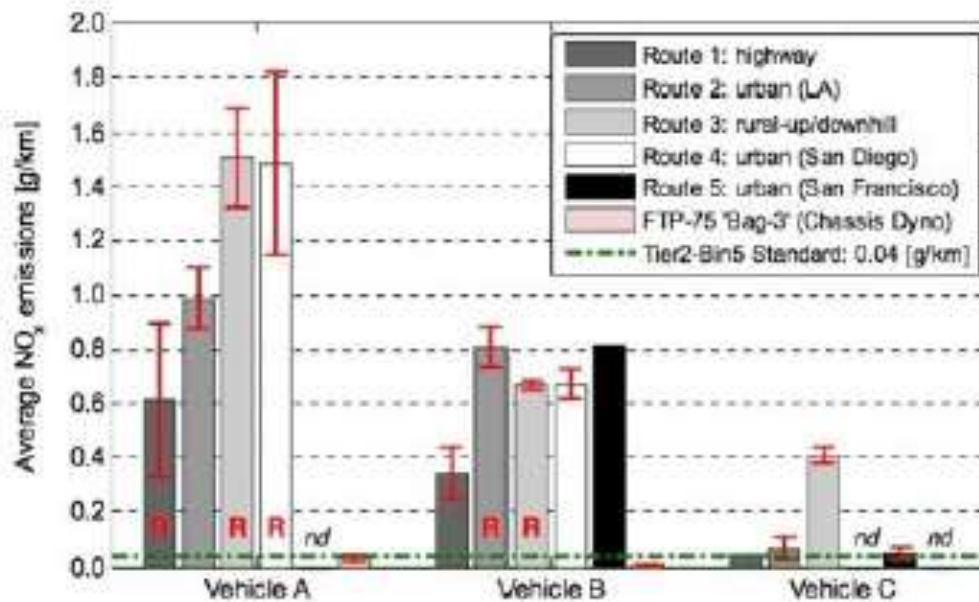

Figure 4.3: Average NOₓ emissions of test vehicles over the five test routes compared to US-EPA Tier2-Bin5 emissions standard; repeat test variation intervals are presented as ±1σ; Route 1 for Vehicle A includes rush-hour/non rush-hour driving, 'R' designates routes including a test with DPF regeneration event, 'nd' - no data available

Source: Thompson, Gregory, Daniel Carder, Marc Besch, Arvind Thiruvengadam, and Hemanth Kappanna. 2014. 'In-Use Emissions Testing of Light-Duty Diesel Vehicles in the U.S.' Center for Alternative Fuels, Engines & Emissions West Virginia University, p. 62

The higher levels of NOx of the Volkswagen autos were surely a problem, that could however be just a technical issue easy to fix. The team decided then to test two of the three autos, the Jetta and the Passat, on a vehicle certification test facility at California Air Resources Board's (CARB), discovering that during lab tests the vehicles produced significant lower NOx emissions, from 50% to 64% below EPA standards (Jaffe 2015). Repeating many times the on-the-road tests and lab tests, and comparing the emissions levels in the different conditions, it emerged clearly how on these vehicles there was something, a *defeat device*, able to differentiate emissions levels during laboratory conditions. The team's engineers and experts explained how this defeat device activated, considering the movement of the steering wheel. During lab tests, the wheels of the car move, but the steering wheel does not, while in real-world driving conditions, the column oscillates following the direction decided by the driver. Monitoring the steering column through computer sensors, the defeat software is able to activate in order to lower emissions levels and pass laboratory tests (Jaffe 2015).

These results were presented to the CARB and the EPA in May 2014. In the period elapsed till the public announcement of violation towards Volkswagen, the German group did not collaborate with EPA and CARB, which were investigating and repeating the tests to find the presence of a defeat device, but conversely it tried systematically to discredit the results of the study questioning the data and the methodology (Gardner, Lienert, and Morgan 2015).

During a conference between the EPA, California officials and Volkswagen executives on the 3rd September 2015, in which the American agencies provided details and evidences of the manipulation and threatened to not certify 2016 VW and Audi diesel vehicles, VW eventually admitted the presence of a software programmed to cheat testing (Gardner, Lienert, and Morgan 2015). The scandal gained public visibility two weeks later, and on the 20th September VW published a press release of Dr. Martin Winterkorn, at that time CEO of the group, in which he admitted the guilt for the violations of the American laws, saying that he was "deeply sorry [..] we have broken the trust of our customers and the public " (Volkswagen AG 2015a), and ordered an external investigation. The public admission of cheating was a shock for financial markets, and Volkswagen's stock price fell in value by a third in just two days after this news (Kresge and Weiss 2015, Picture 6).

Picture 6 – Volkswagen's stock price falls after public admission of guilt (21st September 2015)

Source: Kresge, Naomi, and Richard Weiss. 2015. 'Volkswagen Drops 23% After Admitting Diesel Emissions Cheat'. Bloomberg.com. September 21. http://www.bloomberg.com/news/articles/2015-09-21/volkswagen-drops-15-after-admitting-u-s-diesel-emissions-cheat.

On the 22nd September Volkswagen revealed that about eleven million diesel vehicles worldwide were equipped with the emissions cheating software, initially planning to spend €6.5 ($7.3) billion to cover the costs of the scandal and the recalls (Kottasova and Thompson 2015). The following day, another key fact in the timeline of the scandal: after having initially resisted to requests of resignation from his leadership role, Martin Winterkorn resigned as CEO of Volkswagen, role covered since 2007. In the resignation statement published by Volkswagen, Winterkorn expressed his shock for the events that happened and for the possibility that such a misconduct have been possible in the Volkswagen Group. He accepted responsibility for the "irregularities" proven by U.S. environmental agencies, however recognising that he was not aware of any wrong doing on his part (Volkswagen AG 2015b). Different investigations over fraud allegations and market manipulation have been launched in these months against Winterkorn, trying to establish his role in the scandal (Ewing 2016; Cremer 2015a). This was only the first step of a profound management reorganisation. On the 25th September, Matthias Mueller, former Porsche CEO since 2010, was nominated as the new CEO of Volkswagen Group. In the following weeks, the German company informed that nine managers have been suspended, as suspected of direct involvement in the emissions manipulation issue. Hans Dieter Poetsch, the new board chairman appointed on the 1st October and former CFO of the Group, explained that they "still believe a relatively small number of employees were directly involved in manipulation" (M. Thompson 2015).
Between the managers suspended due to the scandal, it is known the presence of Heinz-Jakob Neusser, head of brand development at Volkswagen brand, Ulrich Hackenberg, head of R&D at Audi and responsible for the technical development across the VW group, and Wolfgang Hatz, head of research and development at Porsche (Cremer 2015a).

At the end of September, more details about the number of vehicles affected have been made public. Volkswagen announced that it was organising plans to fix the 11 million vehicles presenting the defeat device all over the world, most of them with brand Volkswagen (over 5 million), Audi (2.1 million), Volkswagen commercial vehicles (1.8 million) and Škoda (1 million). In Europe, Volkswagen has admitted that around 8.5 million vehicles present the defeat software able to cheat diesel emissions tests in the European Union, as reported by Reuters (Knolle 2015). 2.8 million autos were sold only in Germany. The vehicles affected are equipped with TDI 1.2, 1.6 and 2.0 litre engines.
Volkswagen also revealed that an external investigation, in addition to the internal one which was started just after the explosion of the scandal, will be led by the American law

firm Jones Day (Smith and Parloff 2016).

On the 8th October, German authorities raided Volkswagen's headquarters in Wolfsburg, seeking documents and probes about the emissions scandal. In the following days, different searches have been realised in many Volkswagen's subsidiaries all over the world, and also in Italy, where the police raided the Italian headquarters in Verona and the Lamborghini factory in Bologna, placing under investigation for commercial fraud six managers (Quattroruote 2015). On the same day, Michael Horn, at that time CEO of Volkswagen U.S.A. and who resigned in March 2016, admitted to the US Congress the "Volkswagen's use of a software program that served to defeat the regular emissions testing regime" (Chappell 2015). However, he underlined how the installation of the cheating software was not a corporate decision, but rather the decision of "a couple of software engineers" (Chappell 2015).

The following week, Germany's Federal Motor Transport Authority (KBA) ordered a compulsory recall of all the vehicles presenting the cheating device in the country, around 2.8 million, judging the software as illegal (Schwartz and Cremer 2015). Initially, Volkswagen proposed to German authorities a voluntary recall, in which each individual owners could choose to fix or not the auto, but it was rejected. By European Union rules, Germany's decision indicated that even in the other countries of the EU all the cars containing the software to lower emissions levels had to be recalled. For this reason, the German multinational confirmed the recall of the around 8.5 million autos in the European Union, presenting a specific recall plan with the necessary measures to fix the affected 1.2, 1.6 and 2.0 litre TDI engines to KBA (Ruddick and Topham 2015). At the end of November, the KBA approved the plan and the recall started at end of January 2016 (Bruce 2015).

November was a tense month for the Group. After having reported a consistent third-quarter operating loss of 3.48 billion euros, the first in fifteen years and related to the 6.7 billion euros setting aside to cover the scandal costs (Cremer 2015b), Volkswagen received a second notice of violation by the EPA on the 2nd November. In this notice, Volkswagen has been accused by the US authorities of having "developed and installed a defeat device in certain VW, Audi and Porsche cars equipped with 3.0 litre engines", that allowed an increase of nitrogen oxide emissions nine times higher than EPA's standard (OAR US EPA 2016c). The accusation was related to model year vehicles from 2014 to

2016. Volkswagen initially denied it had fitted any cheating software on these vehicles, but as reported by the EPA, it admitted two weeks later that the 3.0 litre engines had the illegal defeat device since 2009. Around 85,000 3.0litre TDI vehicles sold in the U.S. are involved in the accusation, leading the total number of affected autos in the United States at around 590,000 (OAR US EPA 2016c). In the following Table 3, a list of the models and model years which presents the illegal software in the U.S., according to the EPA and the US Department of Justice:

Table 3 - Affected 2.0 and 3.0 litre TDI models and model years

2.0 litre TDI models and model years	3.0 litre TDI models and model years
Jetta (2009-2015)	Volkswagen Touareg (2009-2016)
Jetta Sportwagen (2009-2014	Porsche Cayenne (2013-2016)
Beetle (2013-2015)	Audi A6 Quattro (2014-2016)
Beetle Convertible (2013-2015)	Audi A7 Quattro (2014-2016)
Audi A3 (2010-2015)	Audi A8 (2014 – 2016)
Golf (2010-2015)	Audi A8L (2014-2016)
Golf Sportwagen (2015)	Audi Q5 (2014-2016)
Passat (2012-2015)	Audi Q7 (2009-2015)

Source: United States Department of Justice. 2016. https://www.justice.gov/opa/pr/united-states-files-complaint-against-volkswagen-audi-and-porsche-alleged-clean-air-act.

On the 3rd November, Volkswagen communicated the results of an internal investigation, in which it was disclosed that, in around 800,000 diesel and petrol vehicles in Europe, carbon dioxide (CO_2) emission levels and fuel consumption figures were also affected by "irregularities" (BBC News 2015). The news caused another fall on financial markets, with the price of the shares decreasing more than 4% on that afternoon (BBC News 2015).The company announced that this issue could cost around €2bn to solve. Just a month later, however, Volkswagen revised the previous estimates about the number of vehicles with irregularities in CO2 emission and fuel consumption levels, announcing that only 36,000 units have this problem (Hotten 2015).

2015 ends for Volkswagen with a comprehensible decline of its sales. For the first time since 2002, worldwide full-year sales declined 2% to around 9.93 million cars, due largely to the diesel emissions scandal, but also to challenging market situations in regions like South America or Russia. In Brazil and Russia, respectively, annual sales decrease -38% and -37% from the previous year (Houston-Waesch 2016). As highlighted in Picture 7, the company's sales in Europe overall increase 2.5% compared to 2014, thanks in large part to the sales in Germany (+4% compared to 2014, + 2.1% compared to December 2014). In the United States, full-year sales remained stable at around 600.000 units, with a little increase of 1.2%, even if in December the effects of the dieselgate proved to be strong: compared to December 2014, VW's sales in the U.S. declined 2%.

Picture 7 – Volkswagen's sales in 2015 by markets

Deliveries to customers by markets	December 2015	December 2014	Change. (%)	Jan.-Dec. 2015	Jan.-Dec. 2014	Change. (%)
Europe	311,200	312,600	-0.5	4,045,400	3,945,200	+2.5
Western Europe	257,500	256,200	+0.5	3,430,200	3,274,300	+4.8
Germany	95,200	93,200	+2.1	1,289,100	1,239,300	+4.0
Central and Eastern Europe	53,700	56,400	-4.7	615,100	670,900	-8.3
Russia	16,300	26,100	-37.5	174,300	275,800	-36.8
North America	85,100	83,200	+2.3	931,800	892,800	+4.4
USA	56,000	57,100	-2.0	607,100	599,700	+1.2
South America	34,500	67,800	-49.2	558,300	794,800	-29.8
Brazil	25,100	55,500	-54.8	389,900	629,800	-38.1
Asia-Pacific	360,900	372,900	-3.2	3,934,900	4,057,700	-3.0
China	329,200	336,200	-2.1	3,548,600	3,675,300	-3.4
Worldwide	834,800	881,000	-5.2	9,930,600	10.137.400	-2.0

Source: Volkswagen AG. 2016.

http://www.volkswagenag.com/content/vwcorp/info_center/en/news/2016/01/VW_Group_AaK.html.

2016 began for the German company in the worst way. Volkswagen started to be investigated for civil, and also penal, responsibilities in over a dozen countries, and it is currently facing hundreds of lawsuits and class-actions from his clients all over the world. On the 4th January, the U.S. Department of Justice filed a lawsuit against Volkswagen for up to $46bn over the emissions scandal, accusing that a defeat software has been installed in around 600.000 autos in the U.S. equipped with 2.0 and 3.0litre diesel engines, with the aim of manipulating emissions control systems during certification tests and exceeding EPA's standards (BBC News 2016).

On March, 278 international institutional investors have filed a €3.26 billion ($3.61 billion) suit against the Group at a regional court in Braunschweig, Lower Saxony (Schwartz 2016). Volkswagen was accused "for several breaches of duty on the capital market concerning the timeframe between June 6, 2008 and September 18, 2015" (Bruce 2016), i.e. the company did not inform timely and adequately the financial markets about the emission issue erupted in September 2015. On the same month, Volkswagen has been sued also by the U.S. Federal Trade Commission. FTC accused the company of having falsely advertised its 580.000 "Clean Diesel" vehicles as low-emission and environmentally friendly, while installing a defeat device and deceiving its loyal customers (Shepardson 2016).

On the 21st April, the German automaker announced an important positive development in relation to the scandal in the U.S.. In fact, it agreed to offer its American customers a "substantial compensation" or the buyback of affected vehicles, only for what concerns the around 500.000 2.0-litre TDI (Cremer and Taylor 2016). On the following day, Volkswagen made public the economic and financial data for 2015. It suffered a loss of €4.1bn for 2015, its first annual loss in more than 20 years, after having increased to €16.2bn the sum to cover the cost of the scandal in that country. In 2014, the profits for the German group reached €12.7bn (Kollewe and Davies 2016).

In June, an important step to conclude the American side of the *dieselgate* has been made by Volkswagen. On the 28th June, U.S. authorities announced that the German firm will pay $15.3 billion to solve the public and private civil lawsuits in the United States, becoming the most expensive agreement ever in the automotive industry in the United States (Shepardson and Schectman 2016). As clarified by the EPA, $10,033 billion will be paid to cover expenses related to buybacks or fixes for the 480,000 VW and Audi 2.0litre diesel cars containing the defeat device (OECA US EPA 2016). In more detail, the owners of the affected cars can decide to have their car repaired, with no costs, or to sell it back to VW, which will return the value of the car prior to the *dieselgate*. In addition, they will also receive from $5,000 to $10,000 of compensation per affected car. The agreement states also that Volkswagen will then pay $2.7 billion to remediate the environmental damages caused by excessive NOx emissions, $2 billion to develop and produce zero-emissions vehicles and technologies, and $603 million for a separate settlement with 44 U.S. States, the District of Columbia and Puerto Rico (Shepardson and Schectman 2016). The EPA explained that the firm have to buy back or fix at least the 85% of the vehicles affected by

June 2019, or it will face a $100 million penalty for each percentage point under this limit. Volkswagen can start the buybacks and the repairs of the vehicles only when the EPA approves the proposed measures, as indicated in the EPA website (OECA US EPA 2016). As of August 2016, a solution to bring the vehicles into compliance with emission standards has not been found yet. It is important also to clarify that this settlement is just a partial settlement. In fact, it established the tasks for Volkswagen to solve the issues related only to the affected 2.0 litre cars and the derived pollution, but it does not address other aspects related to the 3.0 litre vehicles in the US.

As it has been clearly summarised, in the United States the scandal for Volkswagen is coming to a (very expensive) end. In Europe, however, the situation is totally different. Here, the majority of the affected cars has been sold, around 8.5 million units, much more than in the entire American territory. However, the fines that the company could face in the European Union are expected to be much lower, because of differences in environmental regulations and consumer-protection laws compared to the U.S.. According to Volkswagen, the software used to manipulate emission levels during lab tests "is not a forbidden defeat device" under European rules, as reported by The New York Times citing a VW's spokesman (Hakim 2016a). For this reason, Volkswagen has also declared that European consumers will not have any form of compensation, triggering a lot of negative reactions (Smith and Parloff 2016). Currently, Volkswagen is facing investigations and lawsuits in many European countries, including UK, France, Germany and Italy.

In Italy, AGCM, the Italian Competition Authority, announced in August 2016 that it would fine Volkswagen AG and Volkswagen Group Italia S.p.A. for €5 million, the maximum provided by the law, for "unfair commercial practices" related to the use of a defeat device able to cheat emission levels in around 700,000 affected cars sold in Italy since 2009 (AGCM 2016). The Authority highlighted also how the "specific green claims" contained in catalogues and advertisements, which underlined VW's environmental awareness and the low emissions' levels of their cars, were likely to mislead consumers because of false information (AGCM 2016). In a public statement, the Italian subsidiary of Volkswagen announced that it would appeal the fine.

To conclude the paragraph, it is interesting to monitor the impact of the *dieselgate* on Volkswagen's sales. Looking at Picture 8, an interesting point is that for the first seven months of 2016 the sales of the Group are higher than the same period a year before

(+1,3%, 5.9 million vehicles sold worldwide). This surely indicates that the German company, in the last months, has been able to deal effectively with the scandal, at least for what concerns sales volume, recovering important market shares. China and Europe are the most important markets for the company, respectively with a +8% and +2.6% compared than Jan-July 2015. Volkswagen suffers a lot in markets like Brazil and Russia, for the challenging economic and political situations, and also in the United States (-6.8%), where the *dieselgate* had the strongest impact (Volkswagen AG 2016b).

Picture 8 – Volkswagen's sales by markets in the first seven months of 2016

Overview of deliveries by the Volkswagen Group:

Deliveries to customers by markets	July 2016	July 2015	Change (%)	Jan.-July 2016	Jan.-July 2015	Change (%)
Europe	323,800	339,900	-4.7	2,519,500	2,454,700	+2.6
Western Europe	270,200	289,400	-6.6	2,141,600	2,100,300	+2.0
Germany	103,600	113,400	-8.7	788,700	781,700	+0.9
Central and Eastern Europe	53,500	50,500	+6.1	377,900	354,400	+6.6
Russia	13,400	13,300	+0.3	91,900	97,600	-5.8
North America	81,500	81,800	-0.3	525,600	533,000	-1.4
USA	51,300	54,000	-5.1	325,100	349,000	-6.8
South America	37,400	48,900	-23.5	261,200	346,100	-24.5
Brazil	23,900	34,100	-29.8	165,700	245,900	-32.6
Asia-Pacific	311,400	279,000	+11,6	2,353,100	2,222,500	+5.9
China	285,900	246,500	+16,0	2,148,000	1,989,500	+8.0
Worldwide	787,300	791,900	-0.6	5,904,100	5,831,200	+1.3

Source: Volkswagen AG. 2016. 'Volkswagen Group Delivers 5.90 Million Vehicles in First Seven Months'. August 12. http://www.volkswagenag.com/content/vwcorp/info_center/en/news/2016/08/Aak_Konzern.html.
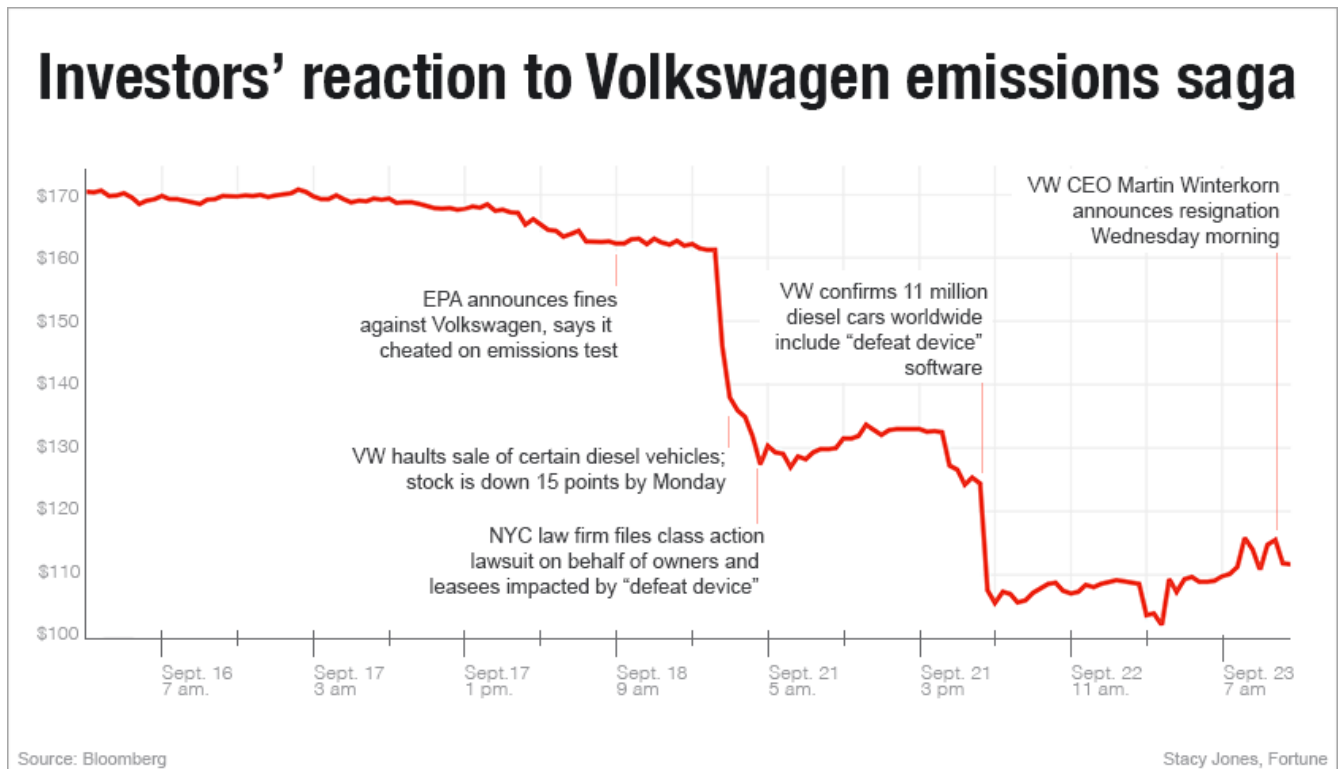
3.2 - *Volkswagen's crisis management programme: analysing its response offline and online*

The outbreak of the emissions scandal was really a dramatic event for Volkswagen.

To have an idea of the impact of the *dieselgate* on the web, it is possible to consider the results of a study conducted by Union Metrics, one of the leading social media consulting firm in the U.S.. Before the 18th September, on average 7,000 tweets about Volkswagen were posted every day worldwide. On that date, this number increased significantly, reaching a total of 43,000 tweets mentioning the company. On Monday, the 21st September, it reached an impressive peak of more than 80,000 daily tweets, and over the following week more than 1.3 million tweets have been posted by users all over the world, on average more than 8,000 tweets per hour about Volkswagen (Parker 2015).

Not only the volume, but also the content of the online data about the VW's brand have been deeply analysed. According to a research conducted by Reputation Manager, the leading Italian online reputation management company, and presented by Il Sole 24 Ore (Merli 2015), 74.3% of the web contents about Volkswagen in the days following the public accusation of deception presented a "very negative" impact on the company's reputation. The most discussed topics, besides the news strictly related to the scandal, were the environmental impact of the manipulation of diesel engines' emissions, present in more than 40% of online conversations with a 91% of negativity, as well as the consequences on the reputation of the German group. This theme was discussed in 25% of online conversations, reaching also in this case a level of negativity of more than 90%. The comments about the quality of the vehicles produced by the company were negative in 37% of the cases, in this case counterbalanced by 30% of positive comments defending the history of the brand.

The impact on the web and on the company's reputation was only one side of the problem. In fact, even more alarming was the reaction of financial markets just after the scandal erupted. As it is clearly observable in Picture 9, on the 17th September Volkswagen's stock price was near $170, but after the announcement of the EPA and Volkswagen's admission that 11 million cars worldwide were affected, it dropped dramatically to a low of $100 on the 22nd September (Snyder and Jones 2015). In just three days, more than a third of VW's shares value has been lost.

Picture 9 – Volkswagen's stock price falls after the explosion of the scandal

Investors' reaction to Volkswagen emissions saga

(Chart showing VW stock price declining from about $170 to about $110 over the period Sept. 16 7 am to Sept. 23 7 am)

VW CEO Martin Winterkorn announces resignation Wednesday morning

EPA announces fines against Volkswagen, says it cheated on emissions test

VW confirms 11 million diesel cars worldwide include "defeat device" software

VW haults sale of certain diesel vehicles; stock is down 15 points by Monday

NYC law firm files class action lawsuit on behalf of owners and leasees impacted by "defeat device"

Source: Bloomberg

Stacy Jones, Fortune

Source: Snyder, Benjamin, and Stacy Jones. 2015. 'Here's a Timeline of Volkswagen's Tanking Stock Price'. Fortune. September 23. http://fortune.com/2015/09/23/volkswagen-stock-drop/.

Considering these data, it appears clear how difficult it was for the German company to face the situation, and it emerges even clearer the need for VW to organise and implement an effective crisis management plan. Resuming the findings proposed by the theory on crisis management and public relations, it is interesting to analyse and evaluate, almost a year on, the response of Volkswagen in relation to the scandal, with a focus on the response online, and compare it with the best practices identified by the crisis management experts.

In a case of deception like this one, recognising publicly the crisis and acting quickly is the first step to make (Baer and Naslund 2011; Poma and Vecchiato 2012). The first 48 hours are the most critical, and it is necessary to provide timely responses to the facts shared by the media or other sources, in order to establish an official presence in the discussion. As said, silence is not a good strategy, because speculation over the news spreads fiercely. According to a part of the crisis management experts (Ritson 2015; J. and E. Bernstein 2015b), Volkswagen had a good initial response to the crisis, acting quickly, apologising and ensuring its commitment to work to make things right with customers and regulators. On the 20th September, two days after the public announcement by the EPA, VW released

a press statement by the former CEO Winterkorn, in which he recognised the violations and expressed his apologies towards customers and American authorities. The same feelings and promises were shared by former VW's USA CEO Micheal Horn the following day during the presentation of a new vehicle in New York, when he clearly admitted how the company "totally screwed up" and acted dishonestly (Sorokanich 2015). In addition, he strongly underlined the willingness of Volkswagen to restore the damages caused and the trust of its (American) customers, not providing however other details. Apologising in a clear and sincere way as Volkswagen did was appreciated also by PR experts Jo Taylor and Simon Collister. They highlighted how the company took the right approach in addressing directly the issue and in assuming the responsibilities for the violations, as well as in launching immediately an internal investigation to have a better understanding of the situation (CIPR - Chartered Institute of Public Relations 2015).

If, on one hand, the company responded timely to the crisis providing a clear message through press releases, video apologies and during public events, on the other hand, its initial approach on social media has been strongly criticised. As noted by many public relation managers and consultants, the initial online strategy of Volkswagen was simply "to do nothing," citing the words of Stuart Bruce, PR expert and CIPR Council member (CIPR - Chartered Institute of Public Relations 2015). On social media, the response was not timely and coordinated at all. After the scandal erupted on the 18th September, in the following delicate days of the crisis Volkswagen's social engagement was null. Until the 22nd September, i.e. four days after the announcement of the violations, its accounts on different social media did not post any message related to the scandal, and did not respond directly to any user mentioning the company. In addition, the global Twitter account of the firm continued its regular marketing campaign until that day, while it should be preferable to stop business as usual posting to show sensitivity towards the affected stakeholders (Davies 2015). On the 22nd September, Volkswagen global account posted a tweet directing to the apology video of Martin Winterkorn, former VW's CEO, and it was retweeted by the other pages of the company also on other social media platforms (De Beule 2015). In the first days of the crisis, this was the only post related to the crisis published on the official social media accounts of the firm. According to an article published by De Beule (2015), on that day the sentiment of the online contents on social media mentioning Volkswagen was definitely negative, around 73%. The general negative sentiment towards the company has surely been increased by the inadequate and disorganised response on these channels, with the company not providing any informative

post and not replying to questions and criticisms by other users.

The lack of coordination in the social media crisis response of VW is evident. As said, in the first days its global account has been used just to share the video apology of Winterkorn, never responding actively to the discussions. A different approach has been implemented by the US and UK Volkswagen accounts on Twitter and Facebook, which shared the apology videos of their respective CEOs and also tried to provide more information, even if limited, to customers actively responding to them in the different online discussions (Davies 2015; De Beule 2015). The other regional accounts of the Group remained silent for more than a week after the scandal broke. According to Bruce, not utilising fundamental channels like Twitter and Facebook accounts in the first phases of the scandal damaged Volkswagen's web reputation on social media, because the company "should have been more active online, taking a much more direct proactive approach and owning the issue at hand" (CIPR - Chartered Institute of Public Relations 2015). In addition, this delayed and diversified response strategy created more tension and confusion for the customers, who were not able to obtain reliable information from a direct and real time source like social media. Different hashtags, as for example #VWGate, #BuyBackMyTDI, #Dieselgate between the most used, spread rapidly on Twitter and on the other social networks, with a myriad of comments of disappointment and anger by the clients. As indicated by Davies (2015), the comments highlighted three main concerns, i.e. the loss of trust by the clients towards Volkswagen's indications, the preoccupation of the company's sales force who asked what to do and the consequences on their business, and the damages to health and environment caused by the higher level of pollution. However, a small part of users, mainly on Facebook, shared messages in defence of the firm, underlining the quality of the autos and the history of the brand (Davies 2015).
On the 27th September, Volkswagen launched *vwdieselinfo.com,* a specific website for the scandal in the U.S., where it shared, and is currently sharing, information and updates for the American customers affected. It also launched the hashtag #VWCares, to promote the contact with the clients that had questions and requests. PR experts recognised the value of these actions, criticising however the timing, judged negatively because happened only ten days after the start of the crisis (De Beule 2015).

For an effective management of a crisis on social media, it is necessary to reply quickly and show interest towards customer's requests. As suggested by Sofie De Beule, Content Marketing Specialist, a timely response on social media must be given even before an

official corporate response has been decided, trying to calm down upset consumers and showing empathy to them (De Beule 2015). As mentioned above, the only response Volkswagen gave in the first week was the apology video, and no other forms of interaction with the customers. Surely, dealing with customers on social networks individually was not feasible due to the enormous amount of comments and posts, but the "total silence" strategy adopted by Volkswagen was not wise at all.

Not only the response must be quick, but also it has to be consistent (Coombs 2014; J. Bernstein 2015). Consistency means that the response of a company to its stakeholders and the media should be unified, coherent and clear. There must be consistency in the messages shared over time, as well as in the actions undertaken for the different types of stakeholders. Over the years, Volkswagen was able to create a strong and successful image: quality of the products, constant research on innovation, and an environmental-friendly attitude. In September, after the admission of cheating emissions tests using a defeat device installed in more than eleven million autos worldwide, the company's main problem was to restore its credibility towards the world. However, as many authors have showed, its response was not consistent over time, both in the messages shared, as well as in the actions implemented.

Since September 2015, the company has struggled in trying to explain itself and its side of the story, with a series of damaging missteps. First consideration: Volkswagen admitted its wrongdoing, with timely public statements and video apologies by the former CEO Winterkorn. However, he attributed such an intricate and complex scandal to "the mistakes of a few people", a statement that, according to the experts, underplayed the seriousness of the crisis and that for the majority of the media and the public was very difficult to believe (Hakim 2016b). Michael Horn, the former president and CEO of Volkswagen Group America, faced directly the problem with the American customers, recognising how the company "totally screwed up", but repeated, also to the U.S. Congress when called to testify, that the problem has been caused by a "couple of software engineers", and that it was not a corporate decision (Chappell 2015). The company has been always clear in saying that the top management was not responsible for the facts. When he resigned, Winterkorn explained in a statement that he was not aware of any wrongdoing on his part, and the company has supported his position. However, investigations showed how the ex CEO could have been informed by internal documents as far back as May 2014, and other processes and lawsuits are emerging against him (Joshi and Hakim 2016). The results of

the investigations and the involvement of Mr. Winterkorn in the scandal are not proven, as for September 2016. The new appointed company's chairman, Hans Dieter Pötsch, provided in December a more exhaustive explanation of the events, presenting the preliminary results of the internal investigation. For the first time, the company recognised publicly that the diesel emissions scandal was caused by "a whole chain" of failures within VW, and not just by the actions of some engineers (Ruddick 2015). He stated that there was a mindset within the firm that tolerate rule-breaking activities if necessary, and that the decision to install the defeat device was made ten years ago. As clarified by Pötsch, work on the defeat device began in 2005, when Volkswagen focused on a strong promotion of its diesel engines in the U.S. The scandal, according to the chairman, resulted by the individual misconduct of a limited number of employees, as well as due to failures in company processes and the tolerance of rule-breaking. Pötsch clarified also that no senior executives had an active role in the manipulation of emissions levels (Repubblica 2015). Crisis managers appreciated the intervention of Pötsch, because he provided a detailed, and believable, explanation of the facts and showed respect and empathy towards customers and stakeholders.

Always considering the consistency of the response, many experts indicated that the company in some cases did not act in a coherent and transparent way, undermining its credibility. As emerged by the investigations in the U.S. and confirmed by the EPA, after the study conducted by West Virginia researchers on May 2014, Volkswagen tried for more than a year to discredit the results suggesting technical problems or mistakes in the analysis. During this period, the company has always denied that it was a deliberate attempt to deceive (Jaffe 2015). On September 2015, when the EPA threatened heavy consequences for the 2016 VW and Audi models in the U.S. market, the company decided to admit the illicit in the country, but what it has never admitted is that it tried to hinder the research. Surely legal liabilities and the safeguard of company's interests are part of the answer, but after the public admission of wrongdoing on the 20th and 22nd September, the firm should have clarified even this aspect, to favour the restore of credibility with the authorities and the clients. In addition, when in November the EPA issued a second notice of violation for 3.0 litre diesel vehicles, Volkswagen initially denied that these autos were equipped with a defeat device for emissions. Two weeks later, however, the admission by VW that even these engines had the illegal defeat device since 2009, as reported by the EPA (OAR US EPA 2016a). In January, another misstep for the firm that gained the attention of the media: during an interview with NPR radio, Matthias Müller, the new CEO

of the Group, answered that they didn't lie to American authorities before the scandal erupted, but that it was just a technical problem and the wrong interpretation of the law (Glinton 2016). Such an underestimation of the issue by the new CEO, in contrast with the reality of the facts and also with prior statements of the company, caused a lot of criticisms, and Mr. Müller was forced to call NPR back to revise his statement (Hakim 2016b).

Not only the message shared, but also the specific actions and decisions that the company implemented to face the scandal have been deeply analysed and criticised by the media and crisis managers for their not unified and uncoherent character. Volkswagen is adopting market-specific strategies, which are very different from each other and that many authors and customers consider unfair. In the United States, where the scandal initially broke and where regulations are more severe, Volkswagen reached an important and very expensive agreement with the authorities for the buyback or the repair of the 2.0litre diesel vehicles and for the compensation of the affected customers. $15.3 billion will be paid by Volkswagen, and each customer will receive from $5,000 to $10,000 in compensation (Shepardson and Schectman 2016). In addition, in the first weeks of October it activated a "Goodwill package" for the U.S. clients, offering up to $1,000 in incentives and three years of free assistance (J. and E. Bernstein 2015b). Using the slogan of the company, Volkswagen is working to make things right, but only in the United States, most authors add (Hakim 2016a; Davidson 2016). Volkswagen UK's CEO Paul Willis was clear in a letter to the Parliament in November that British customers, as well as the other European one, will not receive the same goodwill payments as for the American clients (Joshi and Hakim 2016). In fact, the company has always stated that the so-called defeat device able to manipulate emissions levels during test conditions was not illegal under European rules, even if the KBA, the German authority for transports, judged the software as illegal also in the EU. Volkswagen, however, replied that for the company the software was not a forbidden defeat device in Europe. For this reason, Volkswagen did not recognise the same treatment for European customers, even though it has accepted to recall over 8.5 million autos in the region and fix them starting from January 2016 (Joshi and Hakim 2016). The different behaviour of the company in Europe compared to what done in the U.S. have been strongly criticised by the European authorities, the media and the public, damaging further its current weak reputation. The Group CEO Müller tried to explain even in last July that this strategy derived by the differences in terms of regulations between Europe and the U.S.A., where "the emissions limits are stricter" and "the buyback is

voluntary [for customers], which is not the case in Germany, for example", as reported by The Telegraph (Davidson 2016). He also recognised honestly that a similar compensation strategy for European consumers would cause insurmountable damages for Volkswagen. It is evident how the firm has faltered in providing a consistent response to the crisis, both in the message shared and in the practical actions applied. The limited, and in some cases misleading, attempts to provide a clear and credible explanation of the events, as well as the diversification between U.S. and European consumers, even if comprehensible in a business perspective, do not represent an adequate and transparent response in the perspective of the stakeholders, the real victims of this situation.

The book of crisis management underlined also the importance of providing help for the victims of the crisis, as well as the necessity to change after a similar situation (Coombs 2014; Baer and Naslund 2011). Considering the first point, as it has been discussed, the company took the right approach in the United States, offering an initial goodwill payment to affected customers and then accepting the conditions of American authorities about buybacks and compensation. In Europe however, it has underplayed the impact of the *dieselgate*, and it decided not to indemnify these consumers at all, except for fixing the affected vehicles in the Union. Treating customers differently in those countries has been fiercely criticised. For what concerns financial investors, lawsuits are filling all over the world, but the results are at the moment not available.

The necessity to change translates into a significant reversal of the corporate mindset, and the first step comprehends to cut ties rapidly with company employees involved in some way in the scandal (J. and E. Bernstein 2015a). Volkswagen appeared prepared and coherent in doing this. Former CEO Winterkorn resigned some days after the explosion of the issue to favour a new "fresh start" for VW, assuming his responsibilities for what happened but clarifying that he was not aware of any wrongdoing on his part (Volkswagen AG 2015b). However, the appointment of the new CEO Müller, an insider and trusted colleague of Winterkorn, raised some criticism for the effectiveness of a new fresh start for the Group (Hakim 2016b). Müller and Pötsch, the Chairman of VW, have stated in different occasions that the corporate culture and ideology must be renewed and adjusted, and that the people responsible for the scandal will be identified. Volkswagen, in fact, as a consequence of the first results of the internal and external investigations, suspended nine managers in relation to the dieselgate (M. Thompson 2015), but it is not yet clear who or how many employees were involved in cheating. An important change of direction,

breaking with the past, has been anticipated by the CEO Müller in relation to the future business strategy of the German automaker. "TOGETHER – Strategy 2025", the new Group strategy adopted by the company, aims to establish Volkswagen as the "world-leading provider of sustainable mobility", as revealed in a press conference in Wolfsburg (Volkswagen AG 2016a). This new business direction, indicated as the "biggest change process in the company's history" by the same CEO, has the objective of transforming the core business and intercepting the emerging revenue streams. A massive electrification initiative has been planned: by 2025, more than 30 new e-vehicles will be presented, with a forecasted sales' target of two to three million in each year. Great investments have been anticipated for the development of new competences, in particular related to battery technology, digitalization and autonomous driving (Volkswagen AG 2016a). This new approach, in line with the agreement signed with the American authorities in June, represents a valuable step for the company not only as a potential profitable business opportunity, but also, and in large part, as a way to restore its image and reputation, breaking necessarily with the past.

To conclude the discussion about the offline and online response of VW to the crisis, it is important to note that the number one rule when facing a difficult situation is to follow a previously prepared crisis management plan. As the experts and theorists indicate, the crisis plan has to define the decision-making process, the spokespersons and the preferable communications channels and information to share (Poma and Vecchiato 2012; Coombs 2007). The response of Volkswagen, above all in the initial phases, revealed how the company was not prepared for that. These are the same words that Hans Gerd Bode, Volkswagen's communications chief, used in an interview with The New York Times, confirming that "a crisis like this, the company was not prepared for" (Hakim 2016b). In a "tsunami" like the situation faced by the firm in the first days, with thousands of emails and calls asking for comments and explanations, he admitted that they "did not know the right way out". In addition, one of the greatest mistakes in the response strategy of VW was the initial null social engagement on fundamental channels like Twitter or Facebook, which created more tension between interested users and surely affected the company's reputation. After the first delicate weeks, Volkswagen applied an improved crisis management plan, providing a quite unified message ("we are working to make things right") and defending the corporate strategic decisions, even with significant missteps as it has been analysed (Spaulding 2016). Many authors, however, point out that Volkswagen, considering the long period in which the authorities have investigated before the scandal

went public, should have prepared better to a scandal like this, forecasting the possible outcomes of its deceptive behaviour and exercising possible solutions, but it seems that it was not done (Joshi and Hakim 2016; Spaulding 2016; CIPR - Chartered Institute of Public Relations 2015). On the other hand, it must be recognised that the developments of such a complicated and vast crisis were, and will be, very difficult to foresee, and that the company has already passed, even with huge financial losses and reputational damages, the most critical phases of the scandal maintaining consideration by the customers and by the financial markets. As for the 5th September 2016, the current price of Volkswagen's shares reaches around €130, much lower compared to the pre-crisis value of €170, but consistently higher than its value a year before, in the delicate days following the explosion of the *dieselgate*, when it reached the low peak of €95 (Marketwatch 2016). The trust on the company has not vanished completely.

These considerations are obviously partial and limited in time, because it is not possible to forecast all the future consequences of this scandal, which will last surely for a long period. In addition, the effectiveness of Volkswagen's response can be analysed in greater detail presumably only after some years.

Part 4. RESEARCH: ANALYSIS OF VOLKSWAGEN'S WEB REPUTATION ON TWITTER AFTER THE EXPLOSION OF THE DIESELGATE SCANDAL

4.1 - *Research objectives and procedure*

As indicated in the title of this final chapter, I conducted an analysis to monitor the web reputation of Volkswagen on Twitter after the scandal emerged in the middle of September 2015. In doing this, I gathered 115,162 tweets as a significant sample for the study, considering a limited period of time, from the 18th September to the 26th October 2015, precisely thirty-eight days. Some authors (Davies 2015; De Beule 2015; Merli 2015) analysed different parameters to understand the impact of the scandal on the e-reputation of the company, but limited just at the following days after the *dieselgate* erupted. Consequently, I decided to extend the time horizon of the analysis, to develop a more complete and comprehensive study on this interesting topic. The hypothesis from which the research starts is that the scandal have negatively affected the web reputation of Volkswagen. Using R, the open-source and free software for statistical computing, I focused the analysis on three main parameters affecting the web reputation: the frequency of the tweets in the period and how it variates according to the events happened, the most frequent words and their variation in these weeks, and the sentiment and the emotions that can be derived from the tweets on a daily base. The methodology and the results related to the three parameters under analysis will be presented in the following paragraphs.

Before discussing the findings of the study, it is important to specify the procedure with which I gathered the data and I extracted information from them.
As said, I used Twitter as the source to retrieve useful data for the analysis. Twitter is among the largest microblogging and online social networking sites, both in terms of active users, 320 million, and in terms of daily volume of tweets, around 500 million (Statista 2016). In addition, an important characteristic of this social network is its simplicity, with short posts of maximum 140 characters categorised directly by users through tags inserted in the tweet. For this reason, the tweets contain a lot of information easy to gather, as for example date and time, user name and ID, language, location, likes or retweets, and of course, the message shared through the online platform. Twitter has been indicated as one of the most reactive online arenas especially after events of public relevance, and it has been used as an affordable source of information for different studies (Latonero and Shklovski 2011; Chan 2013; Boyd 2010).

Using the function of Advanced Search on Twitter, I set up the search query on a daily basis selecting *volkswagen* as the keyword for the research and *English* as the language of the tweets. For example, for the tweets published on the 27th September, the search query I used is: *Volkswagen, lang:en, since:2015-09-27 until:2015-09-28*. I have decided to consider only English written tweets to facilitate the textual analysis. In addition, the location of the users was not a parameter of interest in this study. Then, I copied the resulted tweets on a text file, and I followed the same methodology for each day in the period of thirty days I considered. The total amount of tweets, which constituted the sample for the research, is 115,162. The raw information obtained from Twitter and copied on a text file presented this structure:

nic @nicoliiollii 27 set 2015

I will NEVER own another Volkswagen again

0 Retweet 1 Mi piace

Altro

Then, I uploaded the text files on R, and the first step was to categorize and divide the different types of information. Following the structure of the text files, I have subdivided the data along different categories, as for example Message for the content of the tweet, User, Date, Retweet, Hashtag and others (Picture 10).

Picture 10 – Categorization of textual files on R

	Message	Text	User	Date	Retweet	I.LIke	HashTags
1	Volkswagen scandal fuels French debate on whether...	AP 27 set 2015 Volkswagen scandal fuels French de...	AP	2015-09-27	99	58	NA
2	I will NEVER own another Volkswagen again	nic oliiollii 27 set 2015 I will NEVER own another Volks...	nicoliiollii	2015-09-27	0	1	NA
3	Volkswagen shares could get cheaper: Barron's: Buyi...	BusinessHeadlin 27 set 2015 Volkswagen shares co...	BusinessHeadlin	2015-09-27	0	0	NA
4	I try to keep my language clean on here. But there re...	johnnycate 27 set 2015 I try to keep my language cl...	johnnycate	2015-09-27	0	3	NA
5	Seven reasons Volkswagen is worse than Enron <B-U...	crampell 27 set 2015 Seven reasons Volkswagen is ...	crampell	2015-09-27	5	32	NA
6	Bosch Delivered Emissions-Related Software to Volks...	rponceel 27 set 2015 Bosch Delivered Emissions-Rel...	rponceel	2015-09-27	0	0	NA
7	but rather saving the financial backside of those wh...	lizzie363 27 set 2015 but rather saving the financial ...	lizzie363	2015-09-27	1	1	NA
8	Consumers UnionRetweeted The Verge Tell Consum...	ConsumersUnion 27 set 2015 Consumers Union ha R...	ConsumersUnion	2015-09-27	8	0	#dieselgate
9	Volkswagen How many others are close behind, Just ...	Mintzberg141 27 set 2015 #Volkswagen How many ...	Mintzberg141	2015-09-27	9	1	#Volkswagen
10	Why were there no whistleblowers with respect to th...	RichardBistrong 27 set 2015 Why were there no #wh...	RichardBistrong	2015-09-27	1	0	c("#whistleblowers", "#Volksw
11	Volkswagens evil scheme displaces Bond villains an...	TabathaSouthey 27 set 2015 Volkswagen's evil sche...	TabathaSouthey	2015-09-27	8	8	NA
12	Beyond Volkswagen: 8 companies that have behave...	avfolk 27 set 2015 Beyond Volkswagen: 8 companie...	avfolk	2015-09-27	0	0	NA
13	Volkswagen & Martin Shkreli are cut from the same cl...	FarFlungPhil 27 set 2015 Volkswagen & Martin Shkrel...	FarFlungPhil	2015-09-27	0	0	NA
14	Volkswagen Boss Quits Over Diesel Emissions Scand...	dgendvil 27 set 2015 Volkswagen Boss Quits Over D...	dgendvil	2015-09-27	0	0	NA

The second step was to clean the Messages, extracting and removing from the raw data

characters or contents, as for example URL addresses, of no analytical interest, and to obtain a clean text. I followed the procedure proposed by Carlo Santagiustina, who also helped me in the analysis, in his paper *Risk and Uncertainty perceptions and beliefs through the web: An application of NLP to textual Big Data from Twitter* (2016), applying specific code lines. Here a punctual summary of the extracting and cleaning process:

Extract and remove non-ASCII characters: **ASCII Text+ Non-ASCII tokens**

Extract all CAPS tokens: **...+CAPS tokens**

Extract and substitute URLs: **...+<URL> tokens**

Extract and remove retweet structure: **...+Rewteet structure**

Extract emoticones, numbers, percent, prices**: ...+emoticones, numbers, %, prices**

Extract and substitute Emails and phone numbers**: ...+ <Email> and <Tel. number> tokens**

Extract #, $, @, Tags and remove them: **...+ #,@,$ symbols**

After having extracted and removed not significant information, I obtained a clean text ready to be analysed according to different parameters, and following precise methodologies proposed by other authors. An example of the cleaning process and the result is here proposed:

Original Tweet (Raw Message)

Richard Bistrong @RichardBistrong 27 set 2015

Why were there no #whistleblowers with respect to the #Volkswagen deception?

http://bit.ly/1NVQlE3 a view via @beyondfreefall

Clean Text (Message)

Why were there no whistleblowers with respect to the Volkswagen deception? <B-URL> a view via beyondfreefall.

As noted, the different symbols (@,#..), as well as URLs, have been removed.

4.2 - *Tweets' frequency in the period: methodology, results and discussion*

The first parameter of interest in the research is the daily frequency of the tweets and its variation in the period. The tweets have been sorted by date in R, and the resulting plot measuring the number of observations for each day can be seen in the following Graph 1:
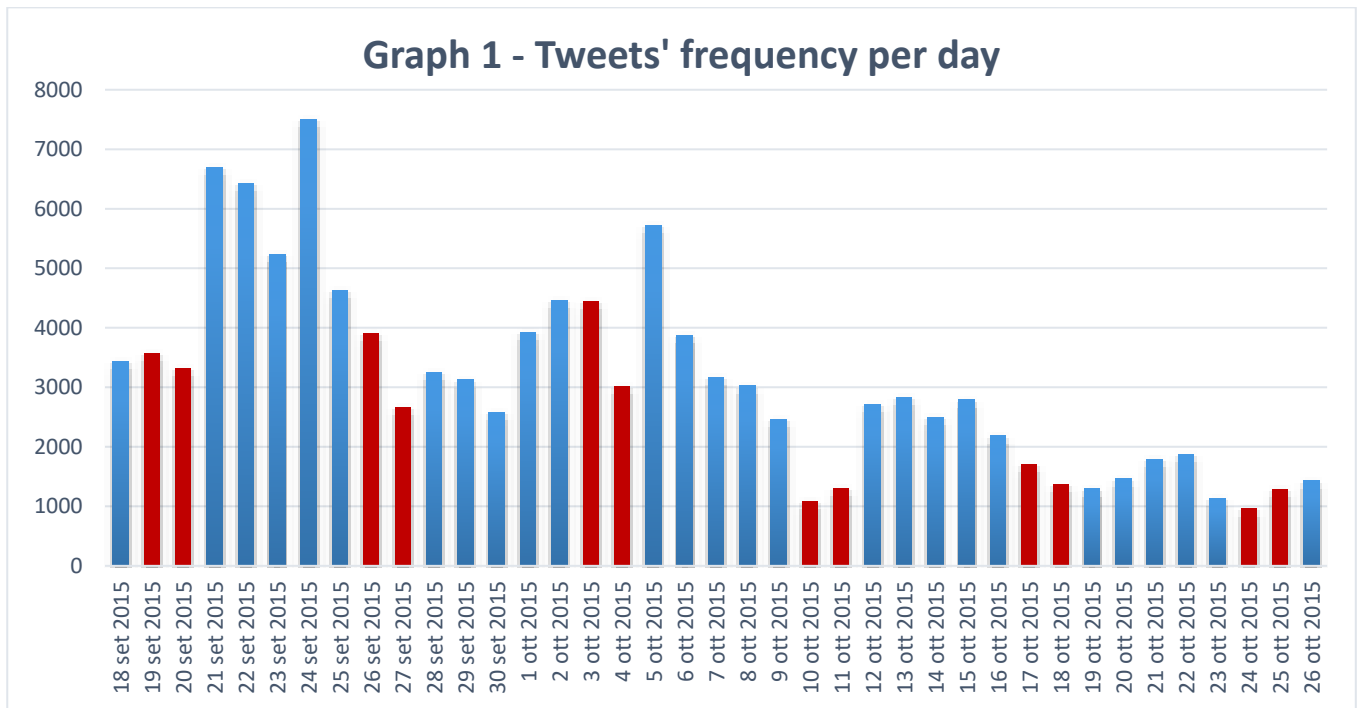
The frequency of the tweets can be considered as an indicator of the interest of the users in relation to a specific topic, in this case *Volkswagen*. As it is logical to expect, the scandal played a determinant role in increasing the interest over the topic *Volkswagen,* above all in the first days of the selected period. As emerged by the graph, the frequency is higher in the first two weeks, with a mean of more than 5500 tweets per day, but from the 10th October, it decreases consistently, with a mean of around 1800 tweets. The peaks are on the 24th September (7501 tweets), 21st and 22nd September (respectively, 6698 and 6432). It is interesting to note that also on the 5th October a peak of 5725 tweets containing the term *Volkswagen* was registered. The minimum, instead, is 961 daily tweets, on the 24th October. In the graph, the red columns indicate the number of tweets posted on the weekend, on Saturdays and on Sundays. It is possible to note that on the weekend, in most cases, the frequency of the tweets tends to diminish compared to the number of tweets posted on the previous Friday or on the following Monday, suggesting that people are less likely to use this social network during weekends.

Considering the general trend, posts and interactions over Volkswagen on Twitter, after the initial boom, decrease in a quite constant way. They follow the trend of the interest over the scandal, which was very high in the first weeks after the announcement of the EPA, and in the first ten days of the period I consider, but then it vanished and normalised on a regular value. In Graph 2, the major facts and news related to the scandal are associated with the trend of the tweets' frequency, to analyse if and how the scandal developments influence the variation of the interest.

Graph 2 - Tweets' frequency trend and major scandal developments
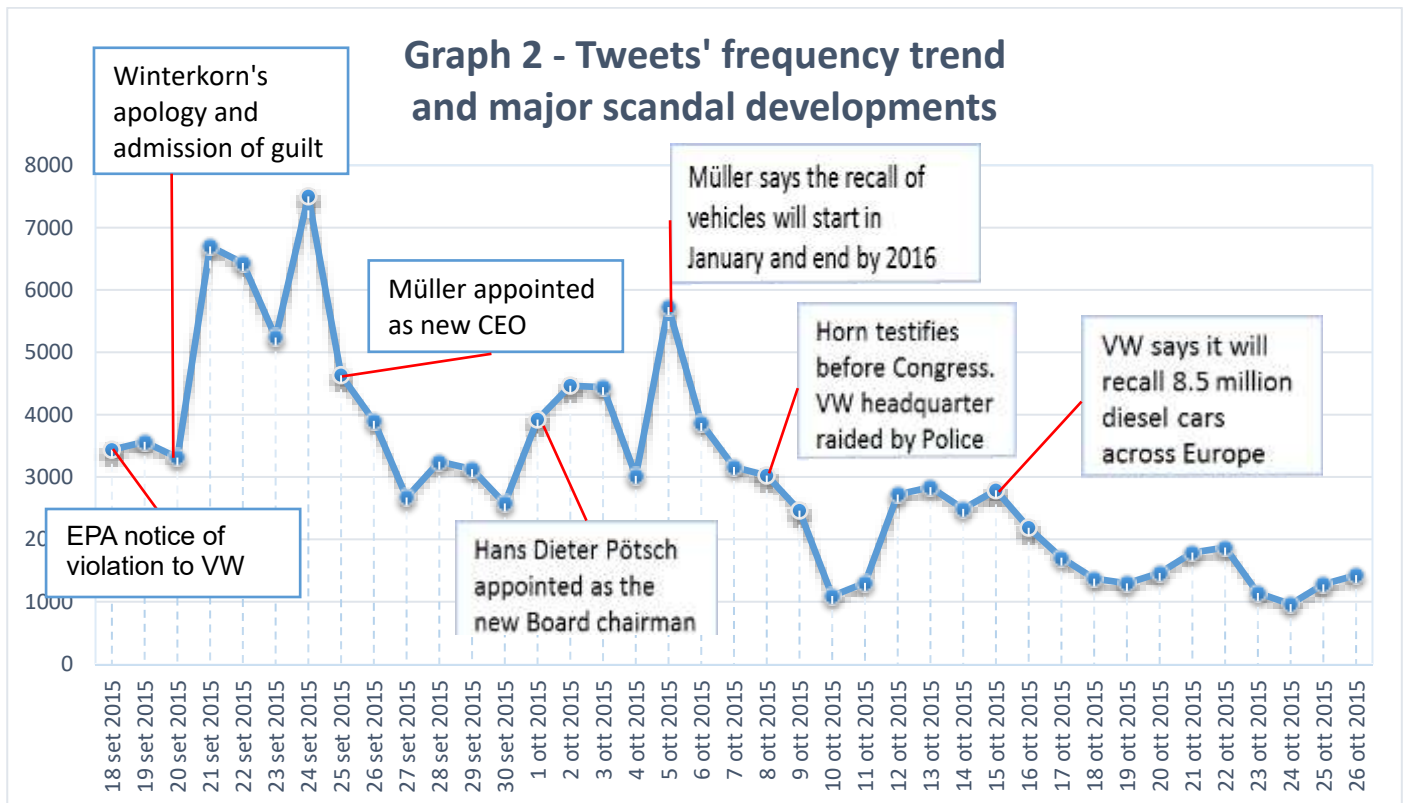
After the announcement of the EPA and the admission of guilt by Volkswagen through the words of the former CEO Winterkorn, the frequency jumped rapidly on the 21st September, Monday, and reached the peak on the 24th. The following day, Müller was appointed as the new CEO of the Group, but the frequency decreased compared to the previous days. On the 1st October, Pötsch became the new Board chairman, the second important nominee after the selection of Müller. On that day, the frequency of the tweets reached level 4000, and increased in the following two. On the 5th October, another peak of interest is reached, with almost 6000 tweets. On that day, Müller announced the initial recall forecasts for the affected autos, explaining that it would start in January and end by the end of the year. In the following days, the level of tweets' frequency decreased rapidly till the 10th October, even if two days before there were important developments related to the scandal: Michael
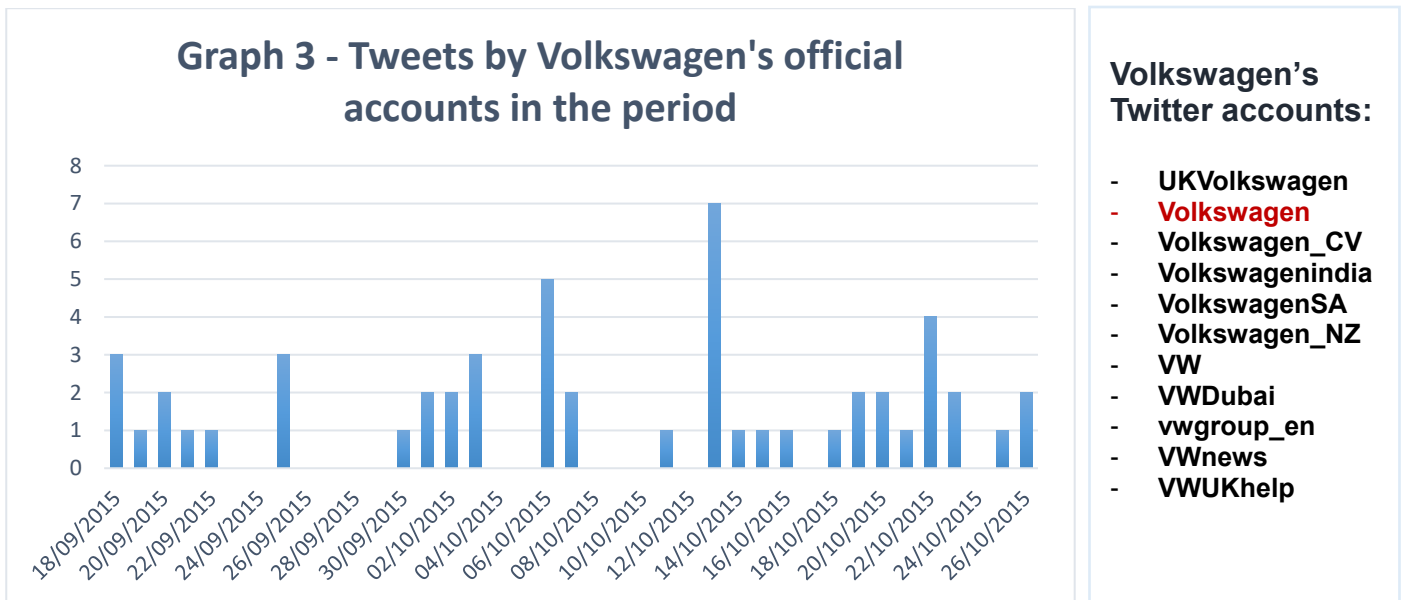
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Horn, former CEO of Volkswagen America, testified before U.S Congress over the manipulation of emissions tests and recognised the guilt of the company; in addition, German police raided VW headquarter in Wolfsburg. The number of the tweets, then, increased rapidly on the following week, when the German authority for transports ordered the recall of the affected vehicles in the country. On the 15th October, VW announced the recall of 8.5 million irregular vehicles across Europe. On the last week, the level of frequency remained stable at over 1000 tweets per day. Surely, the scandal developments that I have highlighted influenced the level of interest over Volkswagen. But it is important to clarify that a direct correspondence between tweets' frequency and the selected scandal facts is not possible to state, because other previous news about the dieselgate (e.g. Winterkorn's resignation, or VW's announcement that 11 million cars present the cheating software) or other topics of interest (e.g. VW rally races) fuelled the discussions in the period under analysis, affecting the level of interest and the number of tweets published per day.

A further point of analysis regards the social engagement of the company in the selected period. As said in the previous chapter, Volkswagen has been fiercely criticised because of its initial "silence" on social networks during the first week of the scandal (Davies 2015). In Graph 3, it is possible to see the number of tweets posted by the Volkswagen's official accounts from the 18th September to the 26th October 2015. Using R, I have filtered the tweets selecting the username of the major Twitter pages of the firm, applying the following code line:

Volkswagentweets <- filter(WIP,
grepl("Volkswagen|VW|vwgroup_en|vwpress_en|Volkswagen_IT|volkswagenindia|VWcanada|
UKVolkswagen|vwbrasil|VolkswagenSA", User))
(WIP indicates the database of all gathered tweets; User is the column containing the usernames of Twitter accounts.)

What emerges by the graph is that Volkswagen had a more consistent presence on this social networking site from the end of September, compared to the initial weeks. During the thirty-eight days under analysis, eleven Volkswagen's Twitter accounts (on the right) posted 52 tweets, with a peak of seven posts on the 13th October.

Graph 3 - Tweets by Volkswagen's official accounts in the period

Volkswagen's Twitter accounts:

- **UKVolkswagen**
- **Volkswagen**
- **Volkswagen_CV**
- **Volkswagenindia**
- **VolkswagenSA**
- **Volkswagen_NZ**
- **VW**
- **VWDubai**
- **vwgroup_en**
- **VWnews**
- **VWUKhelp**

In the following Graph 4, the tweets posted by the official global account, @Volkswagen, have been highlighted. In the whole period, seventeen tweets have been posted. The different colours differentiate the content of the tweets.

Graph 4 - Tweets by @Volkswagen official global account
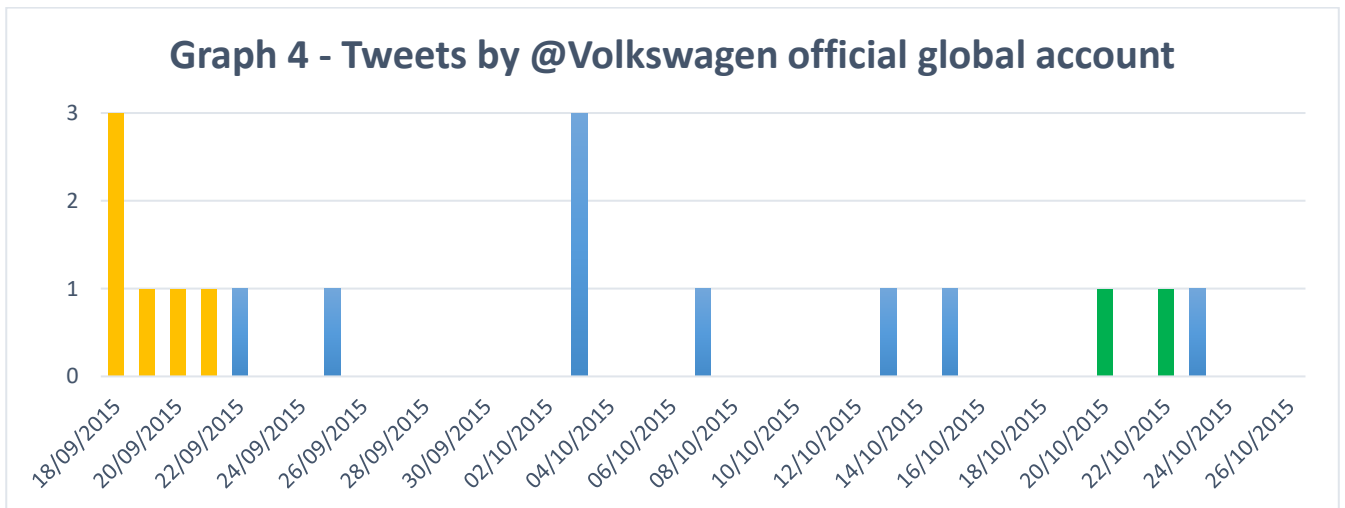
In yellow, the business-as-usual marketing posts (for example Picture 11). We can see, therefore, that the company, as other experts recognised, did not stop its regular marketing activity on this social network after the explosion of the scandal. And it was a mistake, because it allowed angry users to fiercely criticise the company for its deceptive behaviour in a direct and popular channel. Ironically, the posts on those days advertised the eco-friendly character of Volkswagen with its hybrid vehicles.

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Picture 11 – Volkswagen's tweet on its Hybrid vehicles

Then, the great silence of the Group on Twitter, with the global account used only to share the video apology of Winterkorn on the 22nd September (Picture 12) and to inform about the appointment of the new CEO, on the 25th.

Picture 12 – Volkswagen's tweet sharing Winterkorn's apology

Starting from the first days of October, the global account of the company implemented a more active social strategy. The content of the published posts was in the greatest part about developments and decisions of the firm in relation to the *dieselgate* issue (in blue), as for example the tweet posted on the 15th October informing on the decision of the KBA,

the German Transports authority, over the recall of the affected vehicles in the country. Here the original tweet (Picture 13):

Picture 13 – Volkswagen informs about KBA's decision

Of particular interest, instead, the tweets published on the 20th and on the 22nd October, highlighted in green, in which Volkswagen thanked all the employees and the supporters who were defending the company on those days. Here the tweet of the 22nd October (Picture 14):

Picture 14 – Volkswagen thanks for the support

On a crisis management perspective, it is possible to affirm that Volkswagen improved its approach on social media from October. In fact, it informed timely its followers about the major developments of the emissions issue, it replied to some requests by other users (using its regional accounts), and also tried to restore the trust of its customers and employees by thanking them for the support and sharing a message of unity and restart, under the hashtag #wirsindVW (we are Volkswagen). Its social engagement can be considered adequate both in terms of numbers of tweets posted and of contents shared during the second part of the crisis. In the first days, instead, as it has been discussed and proved, the silence of the company on Twitter in relation to the scandal highlighted an initial confusion and wrong approach, demonstrated also by not stopping the usual marketing posts during the worst days of the scandal.

4.3 - *Most frequent terms and their variation in the period: methodology, results and discussion*

The second parameter under analysis regards the definition of the most frequent words and their variation in the five weeks, to understand the major topics of discussion in the period and if the scandal had a primary relevance, or not. To achieve this goal, it was necessary to complete a detailed procedure of cleaning of the text, and a successive categorization by week. I followed the procedure proposed by Yanchang Zaho, clearly explained in his work *Text Mining with R - RDataMining.com: R and Data Mining* (Zhao 2015). The first step consisted in removing all the stop words (as for example "a", "the", "but"…) and not relevant verbs (e.g. "says", "will", "went"..), of no analytical interest. To obtain a final clean message, I applied the following code:

 # build a corpus, and specify the source to be character vectors (selecting column Message from database WIP)
myCorpus <- Corpus(VectorSource(WIP$Message))
 # convert to lower case
myCorpus <- tm_map(myCorpus, content_transformer(tolower))
 # remove stopwords from corpus
myStopwords <- c(stopwords('english'))
myCorpus <- tm_map(myCorpus, removeWords, myStopwords)

Then, after having executed other steps consisting in stemming words and creating a term document matrix, in which terms and their respective frequency have been associated, I created a plot with the most frequent words in the period (frequency over 1500):

TDM <- rollup(tdm,2, na.rm=TRUE, FUN= sum)
*term.freq <- rowSums(as.matrix(TDM))*
term.freq <- subset(term.freq, term.freq >= 1500)
df <- data.frame(term = names(term.freq), freq = term.freq)
library(ggplot2)
ggplot(df, aes(x = term, y = freq)) + geom_bar(stat = "identity") + xlab("Terms") + ylab("Count") + coord_flip()

The resulting graph (Graph 5) contains the thirty most present terms in the sample tweets from the 18th September to the 26th October 2015.

Graph 5 - Most frequent terms: TOP 30
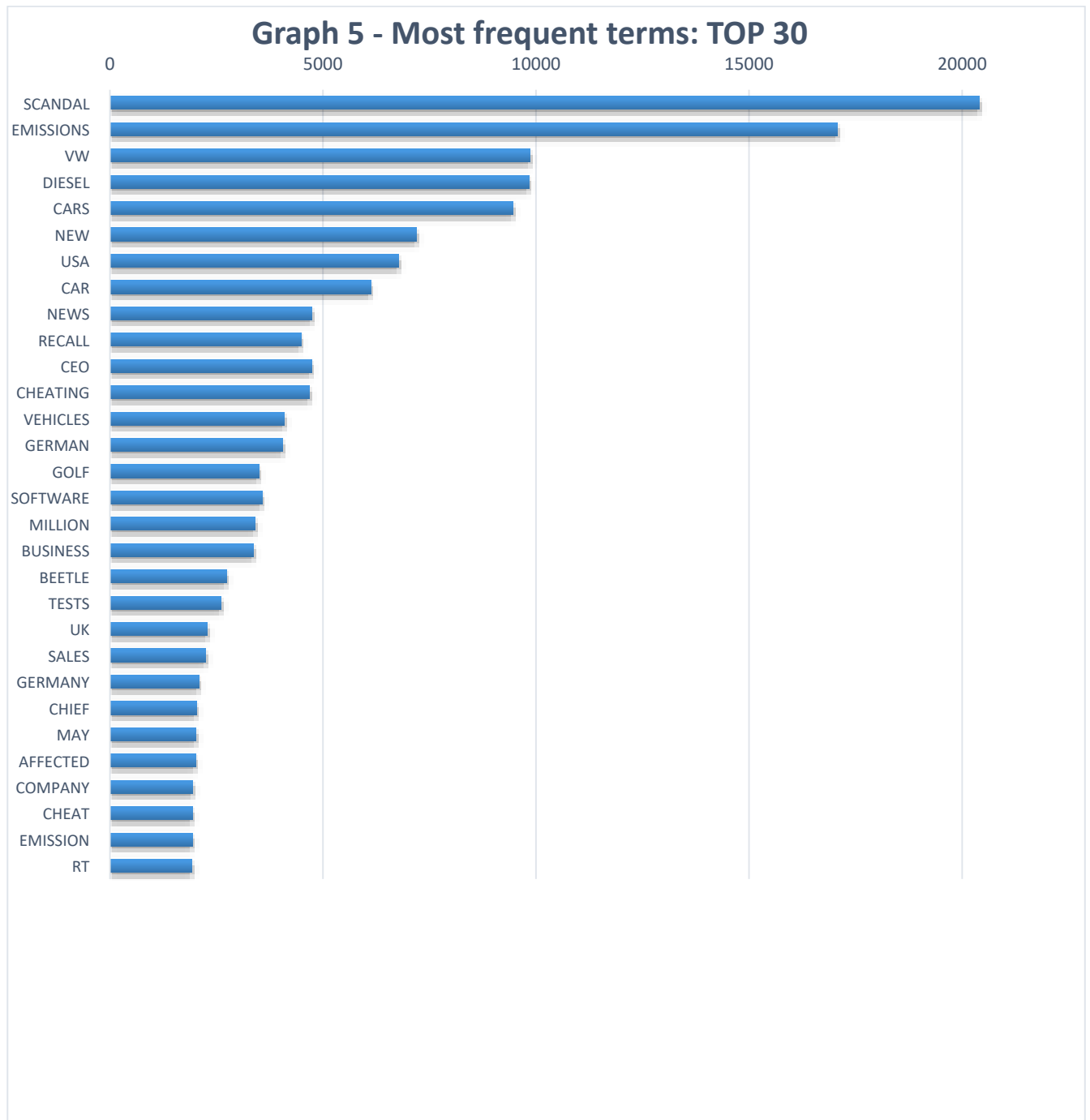
The results are clear: the *dieselgate* scandal gained the maximum attention on Twitter in posts and interactions over the topic *Volkswagen.* As it is possible to note by the graph, the most cited words are *scandal* (20411 times) and *emissions* (17084 times), and after the acronym *vw* (cited 9867 times), *diesel* appears in the list (9835). The vast majority of the terms are, with no doubts, related to the scandal: *recall, cheating, software, tests, affected* are just an example. Terms indicating VW's models, like *Golf* or *Beetle*, can be associated

with the emissions issue, but also with other topics, as for example used cars or selling promotions from the sales network of the company. Terms indicating geographic locations, like *USA, UK* or *Germany,* are linked directly with the dieselgate, because the main developments happened in these countries. In addition, their presence is facilitated by the selection of the English language as fundamental characteristic in the search query.

Another interesting point to examine is the variation of the most frequent words in the five weeks, to have an initial understanding of how the topics of interest changed in the period. For this reason, the first step was to modify the data in R, substituting the existing date format (18 set 2015) with a format easier to work with (2015-9-18). Then I ordered the tweets by week, considering the week numbers for year 2015: Friday, the 18th and Saturday, the 19th September 2015 concluded week 38, while Sunday, the 26th October started week 44. To facilitate the analysis and make it clearer, I decided not to take into consideration the initial two days and the final day of the period, which did not enter into a complete week. Therefore, I focused the attention on week 39, 40, 41, 42 and 43, from the 20th September to the 25th October 2015. Here the complete process in R, with which I modified the date format, clustered the tweets by week number and then filtered the message by week:

WIP$Date <- gsub(" set ","-9-", WIP$Date)

WIP$Date <- gsub(" ott ","-10-", WIP$Date)

WIP$Date <- as.Date(WIP$Date, "%d-%m-%Y")

WIP$week <- as.numeric(format(WIP$Date+6, "%U"))

library(dplyr)

Week39 <- filter(WIP, grepl("39", week))

Week40 <- filter(WIP, grepl("40", week))

Week41 <- filter(WIP, grepl("41", week))

Week42 <- filter(WIP, grepl("42", week))

week43 <- filter(WIP, grepl("43", week))

Then, having organised the tweets by week, I applied the same procedure previously explained to find the most frequent words for each week. The results are summarised in the following Table 4:

Table 4 – The Top 30 most frequent words by week

Week39	Week40	Week41	Week 42	Week43
Scandal	Scandal	scandal	scandal	Scandal
emissions	emissions	emissions	emissions	Emissions
Diesel	Cars	usa	cars	Vw
Cars	Diesel	vw	diesel	Diesel
Vw	Vw	diesel	vw	Cars
business	New	ceo	recall	New
Car	Car	cars	new	Golf
Usa	Usa	new	million	Car
Vehicles	Vehicles	cheating	car	beetle
Winterkorn	News	car	vehicles	usa
Ceo	Cheating	news	germany	cheating
million	Sales	germany	dicaprio	software
germany	germany	chief	news	news
Audi	Affected	business	software	may
cheating	Uk	recall	europe	engine
New	million	software	brand	jetta
device	ceo	engineers	uk	passat
software	software	boss	movie	classic
affected	audi	tests	golf	sale
authorities	business	golf	electric	brand
environment	recall	top	usa	cheat
Uk	tests	vehicles	diesels	investigating
Golf	Fix	company	business	business
investigation	Rt	emission	tests	sales
number	golf	today	boss	owners
Rt	related	reuters	orders	Top
defeat	refit	dieselgate	company	electric
motor	sale	may	beetle	Tdi
Epa	articles	million	chief	deception
autos	board	affected	china	end

The table is structured in five columns, containing the top 30 most frequent terms for each week, in decreasing order. The different colours help to visualise which words have emerged in each week: in blue, the most frequent terms for week 39; in red, the different terms that have been registered in week 40, compared to the previous one; in orange, the words for week 41, different from the one emerged in the two weeks before; in week 42, most of the words are the same found in week 39, 40 and 41 (respectively in blue, red and orange), while the new terms are indicated in green; for week 43, lastly, new terms are highlighted in yellow.

A first consideration is that almost all words refer to the emissions issue, in each week. This confirms again how the scandal monopolised the attention over Volkswagen in the days selected. In fact, the words *scandal, emissions, diesel, cheating, usa* maintain the

first positions in the whole period. In the first week, to notice it is the presence of the terms *Winterkorn* and *EPA,* two of the most important protagonists involved in the scandal. In week 40, the term *recall* emerged in the ranking, with a frequency higher than 780. In the third week (41), it is interesting to note that the term *dieselgate* appeared in the list, with a frequency over 600. Even the term *engineers* has been used very frequently (more than 750 times), probably sharing the news over the suspension of some Volkswagen's employees or reporting the words of VW's top managers when blaming some "rogue engineers" for the facts. In week 42, the words *Di Caprio* and *movie* seem not to have a connection with the dieselgate. However, this is not true, because above all on that week the news that the Oscar-winner actor was planning to produce a movie about the scandal that hit the German company has been insistently diffused. For what concerns the last week, different model names are present in the list, as for example *Golf, Beetle, Jetta* and *Passat.* In addition, even if in the last positions and with lower frequencies, it is important to highlight terms like *investigating, deception* and *end,* which surely affected negatively the web reputation of Volkswagen.

4.4 - *Analysis of the sentiment and of the emotions: methodology, results and discussion*

The analysis of the sentiment and of the emotions that emerged by the sample of 115,162 tweets about *Volkswagen* in the limited period considered is the last point of this personal research. Monitoring these aspects is today necessary, above all in business, and it is facilitated by the unstoppable development of the online platforms like social networking sites. In crisis situations, as it has extensively discussed in this thesis, analysing the sentiment towards a company or a brand allows a good understanding of the damages in terms of reputation, and consequently to plan adequate responses, online and offline. The sentiment analysis, however, is applied also for many other goals, as for example to track the response to new company products, to evaluate the tendencies during political elections, or to monitor the results of particular events or initiatives. Thus, in the last decades, many scholars and researchers on natural language processing developed consistently this topic, especially trying to determine the polarity of words, phrases, or documents. In other words, they wanted to determine if a word or phrase expresses a positive sentiment towards an entity, or if it has a negative polarity (Mohammad and Turney 2013). Consequently, different lexicons and dictionaries proposed by various authors have been created, in which, following various methodologies, each word is associated with a positive or negative value.

In this study, I decided to develop the analysis using the NRC Emotion Lexicon proposed by Saif Mohammad and Peter Turney (2013). It is a list of 14,182 English words (but it is available also in other languages), which are not only associated with the two fundamental sentiments, positivity and negativity, but also with eight basic emotions, respectively anger, fear, anticipation, trust, surprise, sadness, joy, and disgust. As they exhaustively explain in their paper *Crowdsourcing a Word–Emotion Association Lexicon* (Mohammad and Turney 2013)*,* they created a large, high-quality, word-sentiment and word-emotion association lexicon by manual annotation utilising Amazon's Mechanical Turk service. They focused on the eight emotions classified by Dr. Robert Plutchik in his studies about the psychoevolutionary theory of basic emotions (Plutchik 1980). Dr. Plutchik created a *wheel of emotions* (Picture 11), in which the similar emotions are placed next to each other, while the contrasting ones are diametrically opposite.

Picture 11 – Plutchik's Wheel of emotions

According to this theory, the contrasting emotions are incompatible. In other words, it is not possible to feel at the same time joy and sadness, as well as anger and fear, for example. For the completeness of the information, the term *anticipation* means to have a sense of control over the future, to be able to say what will happen (Mohammad and Turney 2013).

Source: Plutchik (1980)

In order to produce a word-polarity and word-emotion association lexicon, the authors set different sources, as for example the Macquarie Thesaurus and the General Inquirer, to create a list of words and phrases. To establish the association between words and the polarity, as well as the emotions, the annotations were manually done by crowdsourcing on Amazon's Mechanical Turk, and determined through consensus of 2/3 of the annotators. As the authors clarify, a word can be associated to multiple emotions, or it can be emotionally neutral. In addition, a word can be associated to both sentiments (positive and negative), or to none of them (Mohammad 2016).

On R, the package *Syuzhet* contains the NRC Emotion Lexicon, and I followed the procedure proposed by Matthew Jockers to analyse the sentiment and the emotions from the tweets' sample (Jockers 2016).

#WIP$SENTSyuzhet<-get_sentiment(WIP$Message,method = "syuzhet")

NRC<-get_nrc_sentiment(WIP$Message)

Applying the previous code line, I was able to find the number of the words associated to the eight emotions and the two sentiments for each tweet (Picture 12).

Picture 12 – Number of words associated to emotions and sentiments for each tweet

	anger	anticipation	disgust	fear	joy	sadness	surprise	trust	negative	positive
1	0	0	0	1	0	0	0	0	1	1
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	1	0	0	1	0	1
5	0	0	0	1	0	1	0	0	1	0
6	1	1	1	2	0	1	1	1	1	0
7	0	0	0	0	0	0	0	0	0	0
8	0	2	0	2	0	0	0	1	2	1
9	0	0	0	0	0	0	0	0	0	0
10	0	1	0	0	1	0	0	1	1	1
11	1	0	1	1	0	1	0	0	2	0
12	0	0	0	0	0	1	0	0	1	0

Then, I grouped the tweets by date, summing the respective count of the word-emotion and word-sentiment associations, and I found a mean value for each emotion and sentiment in each day (Picture 13), applying the following code:

#Date sentiment

DateSent <- WIP %>% group_by(Date) %>% summarise(MeanPositive = mean(positive),
VarPositive=var(positive),MeanNegative = mean(negative), VarNegative=var(negative),
Anger=mean(anger), Anticipation=mean(anticipation), Disgust=mean(disgust),
Fear=mean(fear), Joy=mean(joy), Sadness=mean(sadness), Surprise=mean(surprise),
Trust=mean(trust), NObs= n(), NUsers =length(unique(User)), HashTag =
names(sort(table(HashTags.S),decreasing=TRUE)[1]), NHashTag =
sort(table(HashTags.S),decreasing=TRUE)[1],UserTag =
names(sort(table(UserTags.S),decreasing=TRUE)[1]), NUserTag =
sort(table(UserTags.S),decreasing=TRUE)[1]).

Picture 13 – Mean values of positivity, negativity and emotions by date

|	Date	MeanPositive	VarPositive	MeanNegative	VarNegative	Anger	Anticipation	Disgust	Fear	Joy	Sadness
1	1 ott 2015	0.4360020	0.4933528	0.7029577	0.6128400	0.1968383	0.2213157	0.14584396	0.4994901	0.13870474	0.14813
2	10 ott 2015	0.5838680	0.6376845	0.5930339	0.5810156	0.2300642	0.2813932	0.17323556	0.3987168	0.21723190	0.19248
3	11 ott 2015	0.5806452	0.5542139	0.6036866	0.5730225	0.2334869	0.2419355	0.12288786	0.3602151	0.21121352	0.14900
4	12 ott 2015	0.5079073	0.4987417	0.6995219	0.5619976	0.2283928	0.2258183	0.11143803	0.5049651	0.15704303	0.18131
5	13 ott 2015	0.6559746	0.6658079	0.6341205	0.4500060	0.1388791	0.2210081	0.09940078	0.5121607	0.24532957	0.10750
6	14 ott 2015	0.5508236	0.6164875	0.6372037	0.4965414	0.1394134	0.2101245	0.12053033	0.4246685	0.19686621	0.14785
7	15 ott 2015	0.4248296	0.4318025	0.4883387	0.5033636	0.1664873	0.2066738	0.09006100	0.3484033	0.12091855	0.11158
8	16 ott 2015	0.5340961	0.5731272	0.5789474	0.5552342	0.1830664	0.2796339	0.11807780	0.3331808	0.19267735	0.14965
9	17 ott 2015	0.4771395	0.5288026	0.6330598	0.5045721	0.2678781	0.3071512	0.20926143	0.4407972	0.16002345	0.19519
10	18 ott 2015	0.6678832	0.5842855	0.7357664	0.5948484	0.3635036	0.3036496	0.16277372	0.7445255	0.13211679	0.18686
11	19 ott 2015	0.5262751	0.5511266	0.6259660	0.5885286	0.2078825	0.2936631	0.10819165	0.4227202	0.14142195	0.17310

Showing 1 to 12 of 30 entries

As you can see in Picture 13, on the 1st October 2015, for example, there were a mean of 0.43 positive words and 0.70 negative words in each tweet published on that day (1071). The simple operation was the following: 0.43 positive words = total number of positive words (461) / total number of tweets (1071) for the 1st October. Considering the emotions, 0.49 words expressing *fear* have been written on average in each tweet on that day.

To evaluate the sentiment using the *syuzeht* method, it is necessary to make an important assumption. If the mean value of the positive words is higher than the mean value of the negative ones, the sentiment is considered positive, and viceversa. When the value tends to zero, it is assumed that there is neutrality in the sentiment. It is important to clarify that this method has some limitations in its methodology (for example, it does not consider

adequately the negations), and it is not the most complete and accurate one to pursue this type of analysis (Jockers 2016). However, it has been widely accepted and used thanks to its simplicity, its wide range of dictionaries and lexicons available, and, considering the NRC EmoLex, the possibility to extend the analysis to the emotions (Mohammad and Turney 2013). In addition, using other methods and packages to develop the analysis was not possible due to technical limitations of the instruments at disposal.

Therefore, to evaluate the mean sentiment on each day and its variation in the period, I subtracted the mean value of the positive words to the mean value of the negative ones, and the results are highlighted in Graph 5.

DateSent$Sentiment <- (DateSent$MeanPositive - DateSent$MeanNegative)
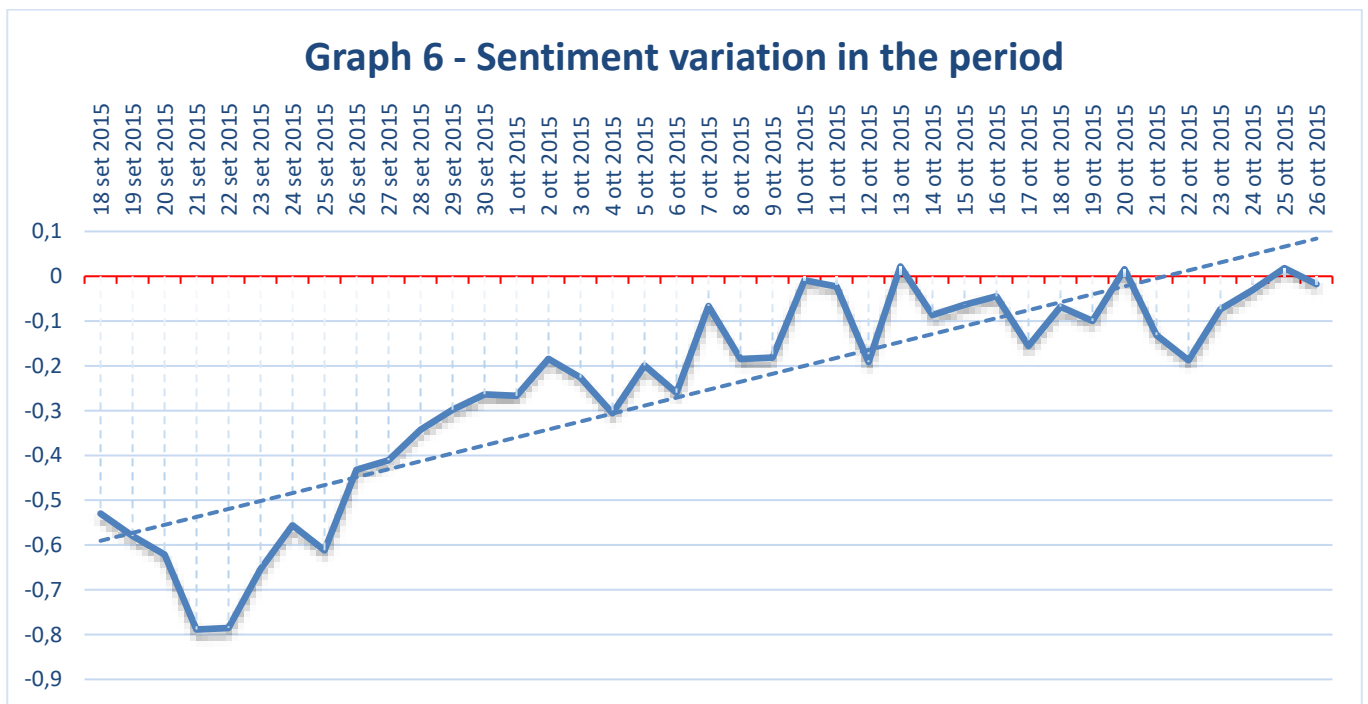
As the graph indicates, the general sentiment towards Volkswagen in the period considered is predominantly negative. In fact, the area of the graph is situated almost totally at negative values. The sentiment trend shows that the negativity is higher in the first week, with the peaks on the first days of analysis, the 21st and 22nd September (-0.79 the mean negative sentiment). The sentiment remains clearly negative until the first days of October, increasing constantly to reach a value of around -0.3. From the 6th October to the end of the period, the value ranges from -0.2 to 0, with a variable trend that however tends to stabilise at a level of neutrality in the sentiment. Only on the 13th, 20th, and 25th October, the mean sentiment has positive values, which are however slightly above zero,

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and consequently indicating neutrality. Considering the results on the frequency of the tweets in the previous paragraph, it emerges how an initial greater amount of tweets, and a greater interest over the topic, in the first two weeks is associated with higher levels of negativity and a clear negative sentiment towards the company. Then, as time goes on, the frequency of the tweets tends to diminish, as well as the negativity, and the sentiment normalises to a neutral value near to zero.

For what concerns the analysis of the emotions, the following graph (Graph 7) presents the aggregate mean number of the words associated to the eight basic emotions by day. In other words, on the 27th September, for example, on 2671 tweets published, 2.4 words in each tweet expressed an emotion: 0.26 words associated to Anger, 0.32 Anticipation, 0,68 Fear, etc.
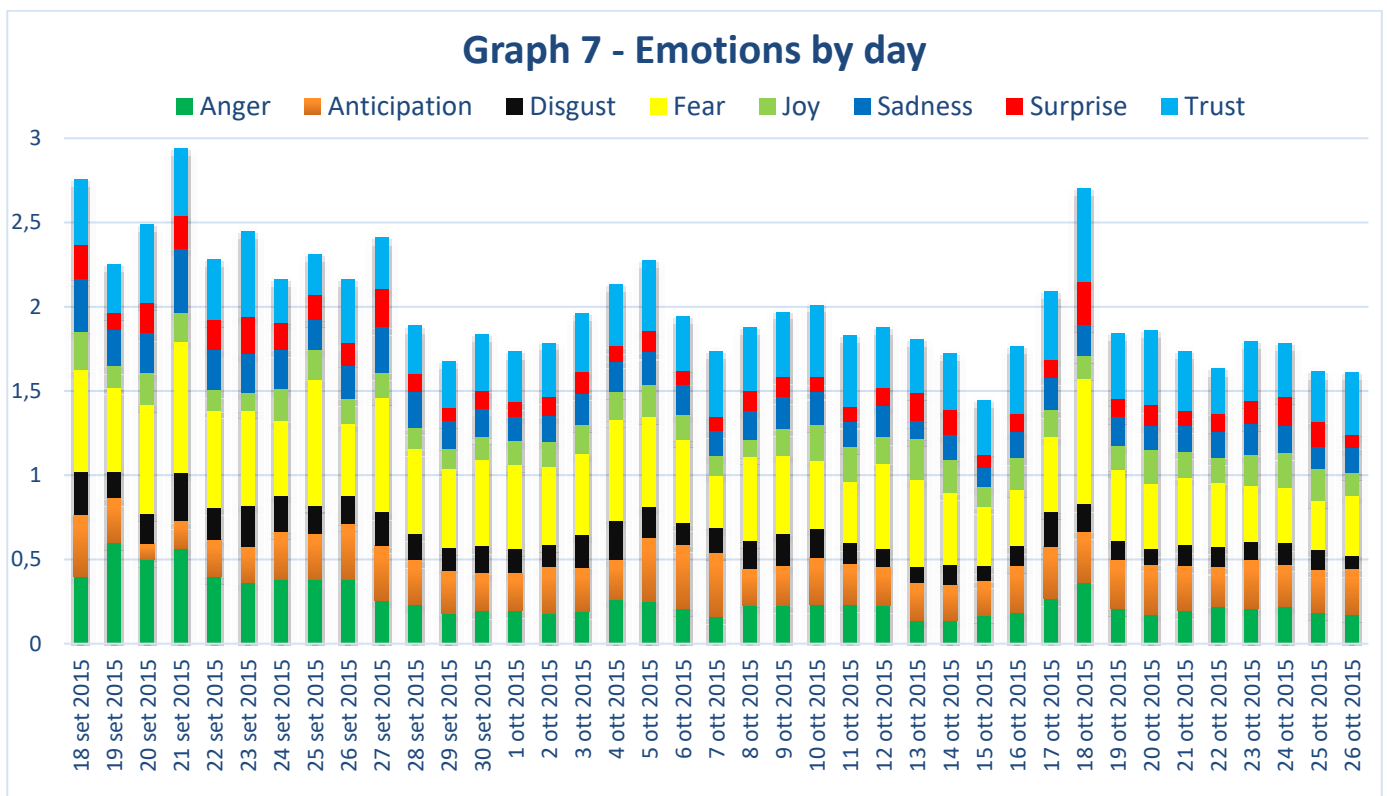
Observing the graph, it is evident how the major emotion shared in the tweets gathered is *fear* (in yellow), with the highest value on each day. Even if it is not possible to clarify the reasons that cause this emotion in relation to Volkswagen (for example, if it is fear for the possible consequences on the stock value, or fear for the loss of jobs as a consequence of the scandal), it surely gives a clear initial impression to understand the response of the public in the period under analysis. It indicates, therefore, that users expressed mainly

their concern and frustration over the events that were happening on those days, probably because they were not able to obtain valid and reliable information from the company and from the media. The second "most shared" emotion is *trust*. This fact gives a controversial indication. On the one hand, it surely expresses that part of the users believe in the actions and statements proposed by the company, in some way defending the history and the power of the brand: this can be considered a *positive trust*. On the other hand, however, trust can be associated with a *negative* sentiment, when users, for example, believe in the accusations of the American and European authorities against Volkswagen and publicly attest their pain. Another interesting consideration regards the *anger*: in the first week of the scandal, this emotion presents consistent values, maintaining 0.5 as the mean. As time goes on, its value decreases rapidly, probably following the trend of the interest over the topic.

Overall, the emotions that have a negative character, i.e. *fear, anger, disgust* and *sadness*, represent the majority of the values, when considered together. This confirms the findings from the sentiment analysis, in which negativity prevails in the whole period, even if not in a clearly significant way. Words expressing *joy* are instead just a minority, while for what regards *anticipation, surprise* and *trust*, a deeper analysis on the contents and topics expressed should be developed, to understand uniquely the positive and negative values related with those two-side emotions.

4.5 - *Open questions and topics for further research*

Evaluating together the parameters studied in the analysis, it emerges how the *dieselgate* scandal have negatively affected the web reputation of Volkswagen on Twitter. Considering frequency, most frequent terms, sentiment and emotions that derived from the sample of 115 thousand tweets, this initial hypothesis have actually been confirmed. In fact, higher frequencies of tweets in the initial weeks of the period are associated with higher levels of negativity; considering the emotions, fear was predominant, followed by high values of anger and sadness. Between the most frequent terms, all referred to the dieselgate, *scandal* and *emissions* lead the ranking.

The research is limited to study the implications of the emissions issue on the web reputation of the firm on Twitter, taking into consideration a wide but limited sample of tweets in a time span of around forty days. However, this analysis provides ideas and insights for further development.

When considering the frequency of the tweets, for example, it appears useful to compare the trend of the data at disposal with the trend of the interest on Google, the most used search engine in the world. In Graph 8, the trend of the interest on Google research for the term *Volkswagen,* in the period September – October 2015.

Graph 8 - Interest on Google Research for the term *volkswagen*
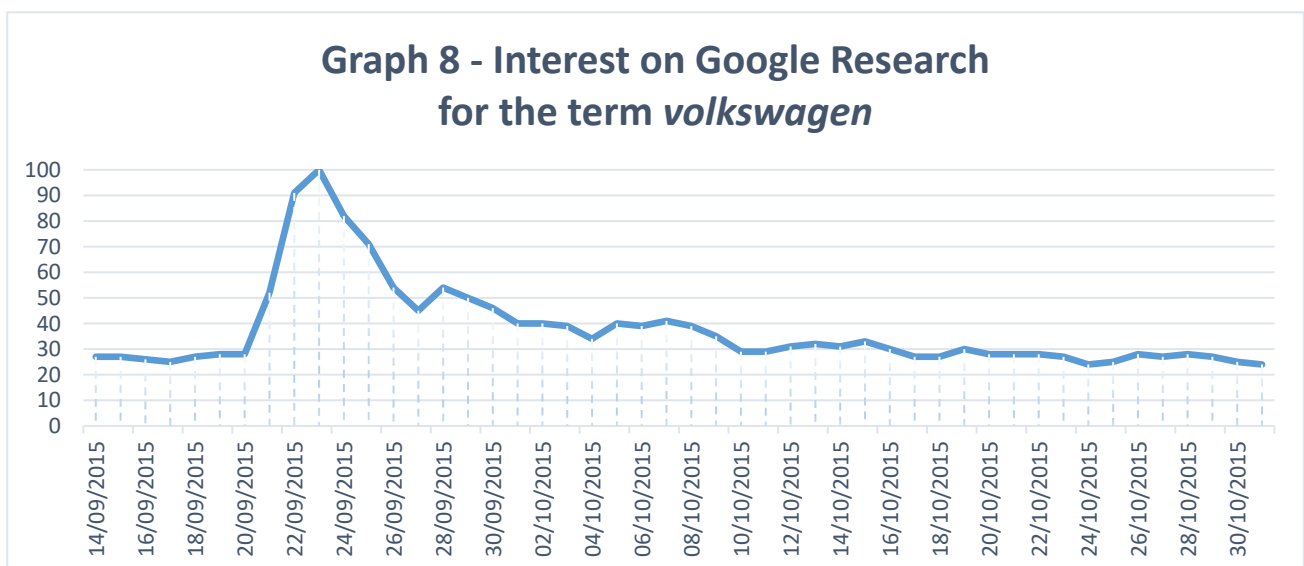
source: Google Trend

Clearly, the peak of the interest on Google is on the days following the 18th September

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public announcement of violations by the EPA, precisely on the 23rd September, i.e. five days after the explosion of the scandal on the media. In the following Graph 9, I have compared the trend of the tweets' frequency with the trend of the interest on Google. As it is possible to see, in general both trends follow a similar line over time, decreasing constantly to slightly higher pre-crisis levels, after the initial boom of interest and interaction that is registered in the first week of the selected period.


Graph 9 - Tweets' frequency vs interest on Google Research
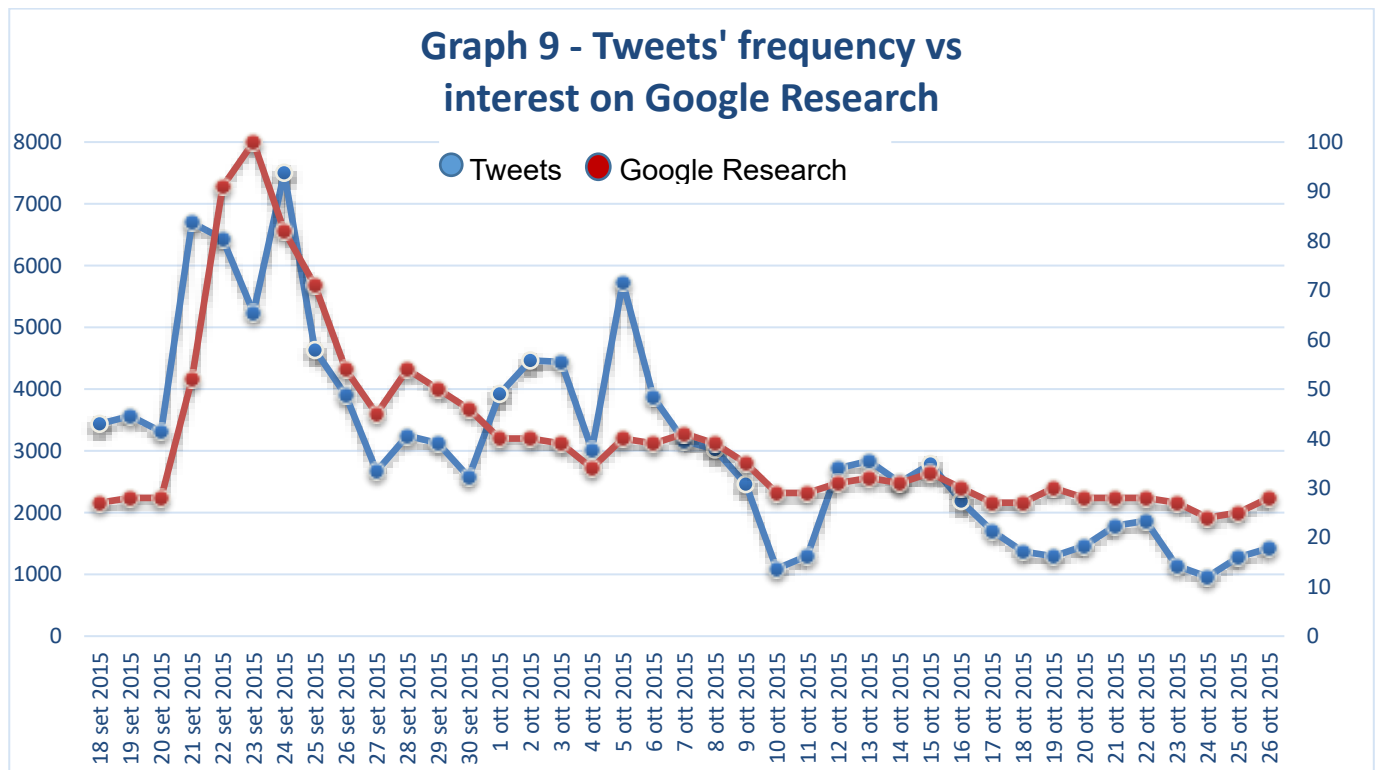
However, it is evident that there are important differences. On Twitter, the highest frequency is registered on the 24th September, while on Google the greatest interest is on the day before, the 23rd. In addition, while on Google the interest diminishes constantly in the following weeks, on Twitter we note an important peak of frequency on the first days of October, precisely on the 3rd and 5th. Supposedly, this indicates that people tend to research news and information on Google as the first step, and then they are shared and diffused on Twitter and on the other social media. Moreover, the duration of the interest, thanks to the discussions and interactions over this topic, appears to be longer on this social network, compared to the organic researches on the search engine. For this reason, it should be interesting to analyse the behaviour of the users in dealing with crisis information online: by identifying all the sources of information on the web and by studying the process with which people know and share the news, a deep analysis of the diffusion

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of the information and of the duration of the interest could be developed. It must be considered, however, that the sample analysed for Google Research is greater than the one for Twitter, and the differences in the two trends are caused also by this fact.

Another point to take into consideration is to evaluate if and how the loss in terms of (web) reputation is related to significant market price variations, considering as an indicative parameter the trend of the company's stock value. As Graph 10 shows, the price of Volkswagen's shares (VOW) decreased dramatically on the days following the explosion of the scandal, passing from €168 to €110 in just five days. In the period selected for the analysis, delimited by the red vertical lines in the graph, it is possible to note that the stock price remained very low until the 6th October, with a value of around €100 (-40% compared to the initial price). However, in the following days and weeks, the financial markets seemed to be more confident on the recovery of the company, and the price of its shares rose significantly to a maximum of €132, with a recovering trend.
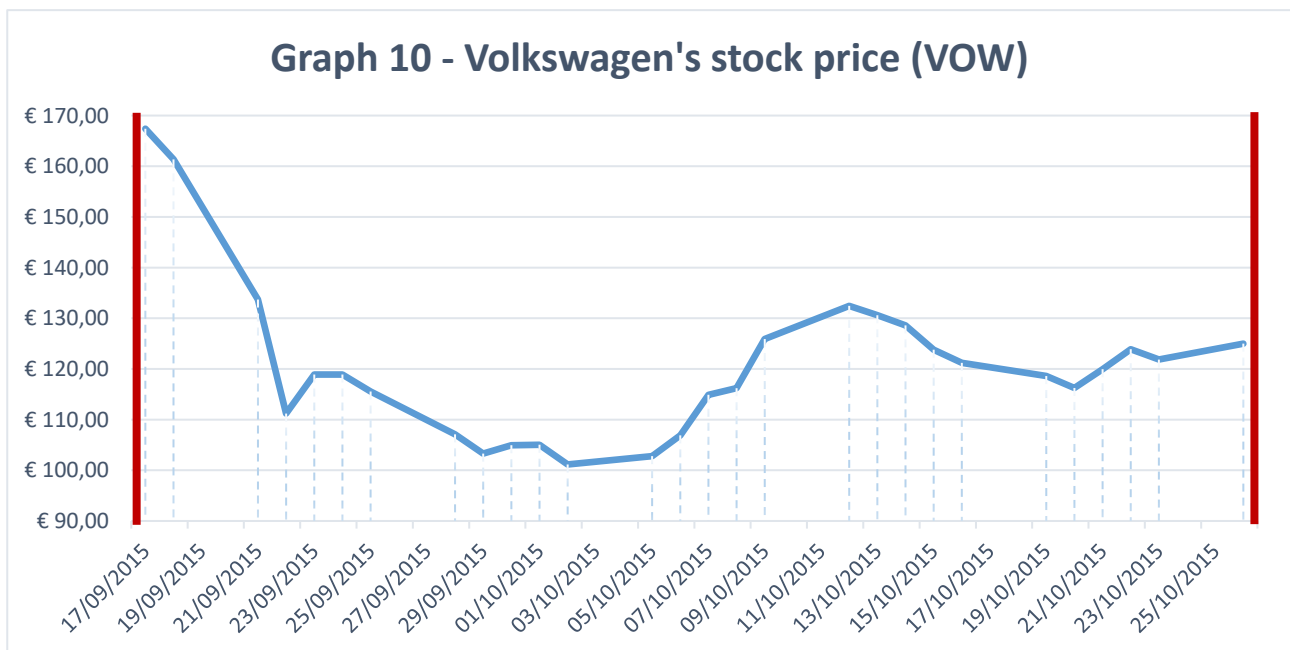
source: Yahoo!Finance

If we compare the trend of the shares' value to the frequency of the tweets and to the trend of the interest on Google, it emerges how in the first two weeks (until the 3rd October), where we have an higher amount of tweets published and a very strong interest over the topic, the value of the shares decreased consistently, remaining to the lowest levels in the whole period. As the frequency diminished, as well as the interest registered on Google research, the value of VW's shares started a promising recovery. A similar consideration

could be done comparing the value of the shares to the sentiment in the period (Graph 11).

Graph 11 - Sentiment vs shares price

Sentiment — Shares' value
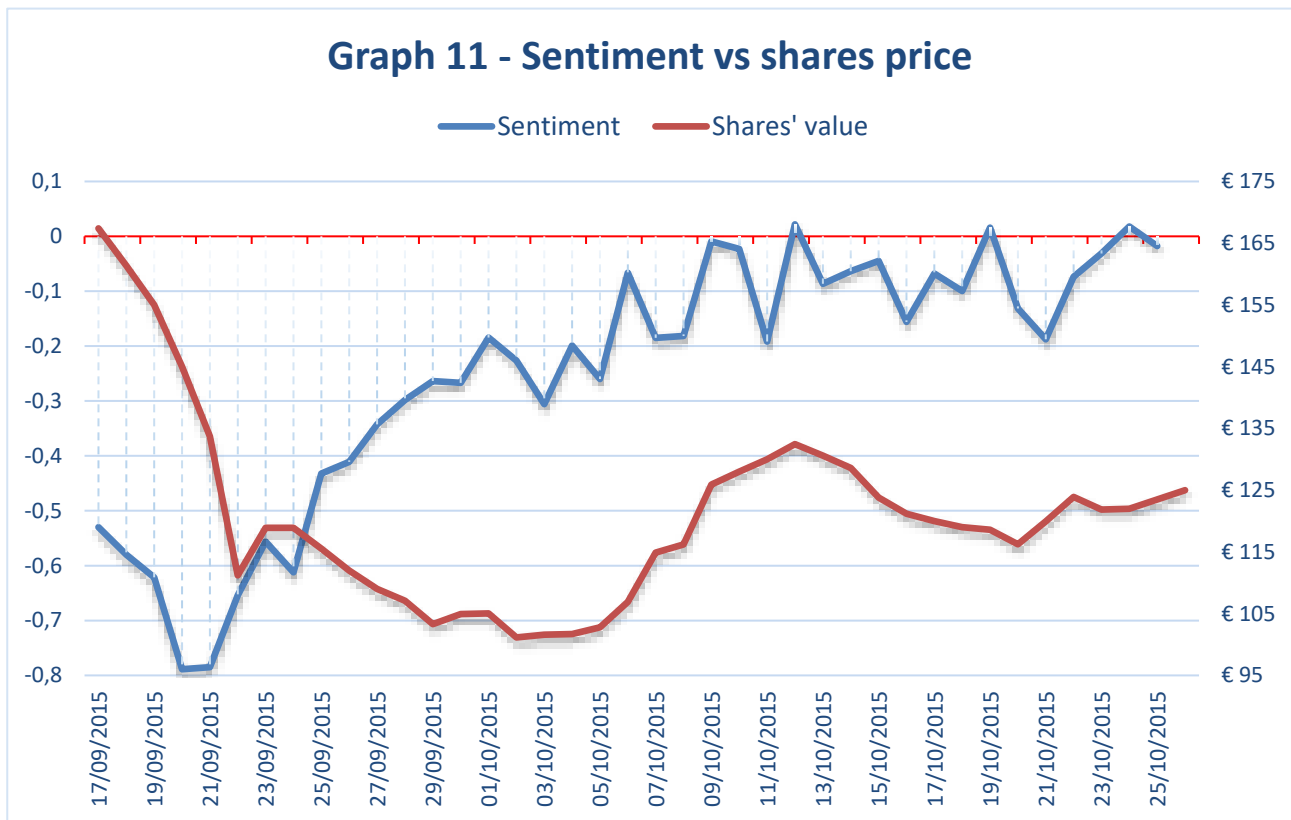
A clear negative sentiment is registered until the 6th October, then it can be considered as predominantly neutral. As it is possible to confront by the graph, the value of the shares was very low and decreasing just until that date, while in the following weeks the trend became to grow rapidly. Therefore, is it possible to affirm a clear and direct relation between tweets' frequency, interest on Google, sentiment and shares' value variation? With the data at disposal in this research, it is not possible. However, the indications that has been discussed prove that there is a possible link between all these factors, which should be further studied and proved in successive analysis of crisis management and social media case studies.

In addition, when considering these parameters, another important aspect could be taken into consideration for further research. In fact, starting from the analysis of the frequency of tweets or posts on social networks, the interest on Google, the sentiment trend and the shares' value in times of crisis, the topic that could be studied is how long, on average, a crisis lasts and produces effects for the affected company. For what concerns the Volkswagen issue, it is evident that each parameter follows its peculiar trend, with unique timing and patterns, as we have seen for example when considering the frequency on

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Twitter and the interest on Google. However, as the different graphs indicate, at a certain point all the situations tend to return to normalcy: the interest diminishes to pre-crisis levels, the value of the shares increases consistently compared to the initial days of the scandal, and the sentiment normalises on a neutral level. In this case study, it appears that the turning point to normalcy happens on the 6th or 7th October. The period in which the *dieselgate* scandal caused the most harmful effects to the company, both in terms of reputation/interest and of share depreciation, lasted approximately twenty-five days (18th September – 6th October). A comprehensive analysis of the mean duration of a crisis along these different channels (social media, Google and financial markets) could have for this reason a great value for companies. In fact, it could be possible to understand how a scandal develops and differentiates in each "arena", what is on average its duration and how long it takes to return to normalcy for each parameter. The final goal is to obtain useful information for organisations in designing specific and timely company policies and responses, to handle effectively a negative situation and to limit its effects on social media, on the web and on the financial markets.

CONCLUSIONS

The scandal that hit Volkswagen was a very interesting case study to analyse within the discipline of crisis management. The *dieselgate*, one of the most relevant and expensive business crisis ever, was not a normal crisis, because it had an unprecedented global scope, as well as a very high relevance on the web. In such a wide and articulate discipline as crisis management is, I decided to focus the study on the increasingly crucial role of social media in crisis situations. By presenting the Volkswagen's emissions issue, I monitored in detail the response of the company to the crisis, above all on social media, and I analysed how this scandal affected the web reputation of the firm on Twitter, in the weeks following the public announcement.

In the first two chapters, it was useful to define the bases on which the whole analysis stands. By defining and discussing the fundamental points in crisis management, I highlighted what constitutes a business crisis, its main phases and what are the best practices that the theory proposes. In addition, it was important to specify the concept of reputation and web reputation, which is essential and strictly linked to the current digital world. For this reason, I presented the main characteristics of the social media, discussing in detail their role in the management of a crisis and why they are so important, but also dangerous, for companies in these situations.

The findings emerged in the theory section were then considered and evaluated in relation to the Volkswagen's diesel engines' scandal. Because of the complexity of the topic, its worldwide media diffusion and the continuous developments that have emerged in these months, and that will emerge in the future, it was difficult to present a clear and precise summary of the events. However, the main facts have been discussed, trying to put in order the different streams of the scandal in the various countries. The core of this master thesis regarded the analysis of the VW's response to the scandal, mainly online, and the presentation of the results of the study on the web reputation of the company on Twitter after its explosion. It has been explained how the company failed in implementing an adequate online response in the first days of the crisis, where it adopted a "total silence" strategy on social media that caused lots of criticism by the affected customers and by PR experts. In addition, the company made other relevant missteps in sharing a consistent and unitary message to its stakeholders, and its decision to implement very different response strategies in the U.S. and in Europe provoked strong reactions, even if it was

comprehensible on a perspective of survival for Volkswagen. The company set up, however, significant actions to recover from the crisis, for example reorganising the top management and investing strongly on electric and zero-emissions engines for the next decades.

For what concerns the analysis of the web reputation of the firm, it has been highlighted that the scandal, and the deficit initial online engagement of VW, had a negative impact on it in the first two weeks of the selected period. Higher frequencies of tweets are associated with a significant negative sentiment, and it has been showed in the analysis of the most frequent words that the *dieselgate* monopolised the attention for the whole period. However, by taking into consideration also the trend of the interest on Google and the trend of the company's shares, in the last two weeks a consistent recovery in its e-reputation has emerged for Volkswagen. In fact, the number of tweets, as well as the negativity, decreased in a strong way, following the same trend in the interest on Google. This, associated with a recovery of the value of the shares, on the one side can indicate, that Volkswagen, after an initial *impasse*, took the right approach on social media to face the scandal: a greater and more effective online presence, as we have seen, with the firm publishing timely and useful information and trying to restore the respect of its customers. On the other side, however, this improvement for Volkswagen could not be totally the direct consequence of its response strategy, but instead it could be determined simply by a general and increasing indifference between the public. In other words, after an initial phase of anger and criticism, no one remembers the committed sins.

To conclude, this analysis is useful in understanding how a crisis situation, and its bad management, can affect the most important asset of a company, its reputation. For this reason, the continuous monitoring and engagement on the web and on social media is an essential part, to have an appreciable estimation of the opinions of the stakeholders and to be ready to respond on these channels during negative events.

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