Threats and Attacks of Corporate Reputation: Are Customers Affected ?

Garyfallia A. Kapetanaki[1], Athanasios Skraparlis[2], Klimis Ntalianis[2], Nikos Mastorakis[3]

[1]Faculty of Pure and Applied Sciences,
Open University of Cyprus
3, Giannou Kranidioti Ave., 2220, Latsia, Nicosia
CYPRUS

[2]Department of Business Administration
University of West Attica
Agiou Spiridonos 28, Egaleo 122 43, Attica
GREECE

[3]Industrial Engineering Department,
Technical University of Sofia,
Sofia, BULGARIA

Abstract—In this paper, the parameters that shape online reputation of a company and the two-way relation between the effect reputation has on consumer behavior and the effect consumer behavior has on reputation are examined. The contribution of this work lies in the fact that it concerns Greek consumers. Moreover, it is important to highlight the particularities of Greek consumers and to confirm or disprove international trends in their case. At the same time, issues related to the extraction and classification of elements related to reputation are highlighted. The answers given through this research and the questions that arise contribute to the formulation of effective strategies for the management of online reputation by the companies, even in cases of attacks and threats.

Keywords— corporate reputation, threat, attack, consumer behavior.

I. INTRODUCTION

IT is common knowledge that a company's reputation is a catalyst for its survival or its downfall. Furthermore, in the context of a globalized economy and the options that the internet provides, we can be informed about anything, "good" or "bad". Reputation knows no bounds. This also means that corporations can make themselves known to a wider client base but at the same time any information about them is public knowledge for those clients. This makes handling a company's reputation a very delicate and difficult matter. A corporation that provides a superior product to its clients earns more reputation than its competitors and its course is considered successful [1]. To establish the tools and methodologies that manage reputation it is needed to strictly define the aspects that compose reputation, but there is great difficulty to interpret corporate reputation because of many different scientific fields that are involved.

We must record that in an age when the internet and the social media are a part of our daily routine, new challenges arise for the corporations regarding managing their reputation. The comments and criticism that the clients produce in forums, blogs, social media platforms and review sites are gaining even more credibility in the eyes of potential clients. They are a fact that determines their consumer habits and decisions. Even if a company improves its products and its services, it is unavoidable that a bad experience can spread to a great number of people. This makes managing negative comments a real challenge. This challenge arises because the online stigmatization of a company comes with the problem that it can't be easily forgotten since the information stay accessible on the internet for ever [2]. Consumers believe that other people experience benefits them, so they are influenced by them [3].

A study made by the "Reputation Institute", a private consulting company, with a sample of 47.000 consumers in 15 deferent markets, classified the 100 most famed corporations in the globe. From the study we learn that 60% of the clients consider as a deciding factor for their choice the opinion that has been shaped about the company, on the other hand 40% consider the opinion about the product as the deciding factor [4]. The emphasis that consumers place on the corporation's

reputation and not only on its products, confirms that fame management is a complex matter, and it is not only based on the production and promotion of a good product.

Companies publish positive comments and experiences of their clients in an effort to boost their reputation and seem more trustworthy to new clients that might even being on the other side of the globe [5].

In this research, the parameters that shape online reputation of a company and the two-way relation between the effect reputation has on consumer behavior and the effect consumer behavior has on said reputation are examined. The contribution of this research lies in the fact that it concerns Greek consumers. The Greek market maybe is small but it is not negligible. Moreover, it is important to highlight the particularities of Greek consumers and to confirm or disprove international trends in their case. This will contribute to the more comprehensive and in-depth study and imprinting of the concept of online reputation. At the same time, issues related to the extraction and classification of elements related to reputation are highlighted. It should be noted that many of them are related to the effective management of the difficulties that arise because of the Greek language, which is quite peculiar and demanding. The answers given through this research and the questions that arise will contribute to the formulation of effective strategies for the management of the online reputation by the companies and to the improvement of the tools used.

II. RELATED WORK

Nowadays, the multitude of comments about a product help consumers shape an opinion about it, before they decide if they will buy it or not [6]. Clearly this procedure is vital for the reputation of a product or a corporation.

It is apparent that this procedure entails bias that can cloud the objectivity. Also, generalizations from a small sample of clients can lead to wrong conclusions about a product or a corporation, resulting in damaging the reputation of said product or corporation.

We must note that many times comments about a product describe expectation and not real experience. This makes designing systems for measuring and managing reputation even harder since you have to find a way to separate expectation from experience [7].

Evaluating products is not necessary an impartial procedure because it reflects the client's personal taste and how he perceives quality. This is the main reason that one can find extremely different opinions about a product. This also explains why positive evaluation about a product is constantly dropping. It also explains why a stable or rising evaluation is expected if the clients have small differences in their tastes or if they can discern the types of commentators in order to highlight the products that fit their tastes better [8]. Impartialities most of the times arise because of the natural bent of humans to reveal experiences that are unusual, also we tend not to share negative experiences. This is why, evaluation

systems have in the vast majority positive comments.

We must point out here that the comment the client is about to share is greatly dependent on the comment the other side to the transaction is going to share. Mutuality plays a very important role [9]. Many times, even positive opinions don't reflect reality, but they derive for the moral obligation that a person feels when he has received a positive comment and wants to return the comment [10]. On the other hand, many consumers and businessmen do not write negative comments because they are afraid of revenge comments from the other side of the transaction, thus they stay silent [9].

Even the evaluation mechanisms create impartialities, for example a mechanism that rewards users based on how many users think that one has made the most valuable comments. This has as a result the most "famous" users that only comment on the most "famous" products to win. We must keep in mind that the meaning of usefulness is also an objective concept [9].

Evaluating reputation is mainly general in most systems. For example, a user can put a good grade in one area (i.e. product quality) and a bad grade in another (i.e. delivery time). This must be reflected in someone's reputation evaluation [11].

The most common threats that a reputation management system is called to deal with, is to find an effective way to deal simultaneously with the following: bad-mouthing attack, bad-collusion attack, sybil attack, re-entry/whitewashing attack, ballot stung.

Corporations in their effort to manage the aforementioned situations react in various ways. Often, they commit fraud by paying people to write positive reviews, like the Amazon Mechanical Turk incident. It is certain that managers should respond to comments because it is very likely that customers won't leave positive reviews, if they are not sure that someone from the other side of the transaction will read it. On the other hand, customers will be extra careful when leaving a negative review and will try to base their opinion on real facts because they know that someone will try to refute them [2]. In this manner the company's reputation is elevated because positive reviews lead to a better rating and negative reviews can be proven wrong. At the same time customers who want to leave an unsubstantiated negative review are deterred and negative reviews with facts are mostly posted, something that might lead to the improvement of the product.

One way to avoid impartiality is for the users not to be able to see the other side's comments till both leave a review [5]. In essence, what this tries to achieve is to have better information and more sincere comments without being influenced from another member of the transaction. On the other hand, the quality of the information is uncertain [7].

It is necessary to note that there are difficulties in the interpretation and evaluation of the results that shape and manage reputation. The complexity of the market makes difficult the clear depiction of the causal relationships between the mechanisms of feedback, the attitude of the customers and how the market works. For example, the low grade of positive

feedback in a platform can derive from the difference in rules of transactions or the different culture the customers have in a country, or the market size and other factors that defer from platform to platform or country to country [5]

In the general context of effective reputation management, measuring reputation plays an important role, which is defined by the evaluation that the customers have expressed about a product. From this evaluation companies must mine (opinion mining), interpret and analyze sentiments (sentiment mining).

The main goal of affective computing and sentiment analysis (SA) is to recognize the sentiments and to pinpoint their polarization. In other words, giving to a sentiment positive or negative value, in order to use it to interpret someone's opinion. Usually, the concerned party focuses on extracting labels that cover an aggregate of sentiments. Often what is implemented is a binary categorization with a result of a positive or a negative, like "thumps up" or "thumps down". But for an algorithm to discern, if a review is biased or not is a very difficult task. One example that could create confusion is the phrase "this animal looks like a monkey", which is an accurate depiction of reality, and the phrase "this man looks like a monkey", which is a biased depiction of reality. This task is very complex if we consider the huge data load the algorithm must process, which might not be only text but, since we all have a camera on our phones, tablets etc, could be images or video as well. This makes, being able to discern sentiments using facial expression, voice tone, body movements, or even the colors someone used or a song he posted, a necessity [12].

Most approaches for mining and analyzing opinion focus on the following 3 categories a) document level, b) sentence level, c) attribute level [13]. The basic ways of approach for sentiment analysis are two. One is based on extracting characteristics using machine learning. The second is referred to as "lexicon based" and uses sentiment dictionaries to attribute positive or negative value to word and phrases based on a sentiment. In the last few years hybrid approaches are followed as well, leading to a shift from the syntactic level to the semantic level and ultimately to the pragmatic level, i.e. the procedure of producing meaning which does not coincide with the meaning of the words uttered and which directly correlates with the contextual framework – both linguistic and extralinguistic – of the utterance.

In our previous works we have focused on different aspects of the reputation analysis problem [14] – [17]. This paper extends previous approaches, by examining the opinions of people in different cases.

III. RESEARCH PREREQUISITES

Nowadays, internet and its capabilities are utilized in almost every aspect of our daily lives. As a result, all those aspects influence as well as many areas of our personal and social life. In this context, online corporate reputation, its significance, its defining elements and many individual characteristics need to be explored under the prism of the widespread usage of the internet by a large sum of consumers that are informed and are also shaping the reputation. An effective way to highlight all these and improve the online reputation management tools and at the same time to have the companies in a position to be able to shape effective campaigns for their products, is a quantitative survey in a random sample of consumers. This quantitative survey will help highlight the general trends and get research findings that will confirm or disprove the facts we analyzed previously. This way empirical analysis will make possible an objective description and explanation of the two-way relationship between the effect of the customers behavior has on reputation and the effect reputation has on said behavior. To gather the sample of the survey, the method that was used was online questionnaires. The survey took place from 04/02/2021 till 11/04/2021. The questionnaire was published in various social media and was answered by 564 people.

IV. EXPERIMENTAL RESULTS

People from most age categories (the small sample on ages 66-75 is normal, since on those ages are mostly digital illiterate), from which most were women and also most of them live in big cities with various levels of education and various levels of knowledge on computer usage, took part on the survey. In the following figures, the most important questionnaire's questions are provided.
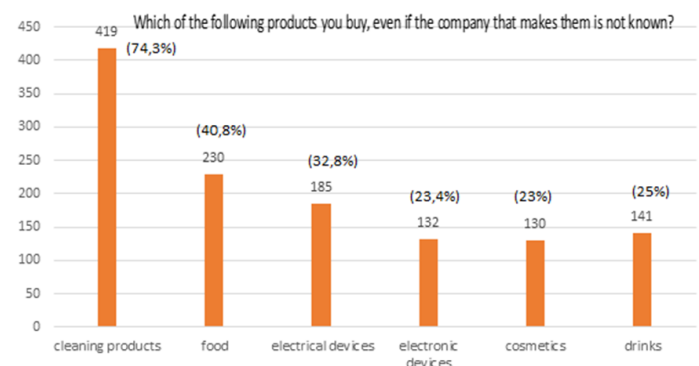

Fig. 1: Products from unknown companies

On the question "Which of the following products you buy, even if the company that makes them is not known?" the vast majority said that it buys cleaning products (74.3%) followed by food (40.8%), electrical devices (32.8%), electronic devices (23.4%), cosmetics (23%), drinks (25%) (Fig. 1). From this, we can see that the customer's behavior depends on the category of the product.

The question, if they have ever searched for customer reviews before buying (Fig. 2), reveals that consumers in Greece consider that the online reputation is a very serious matter, since 94.9% of them said they look at comments from other customers.

Questions 10 ("Do negative comments about a product on the internet affect your purchase?"), 11 ("Do negative comments about a company affect your purchase?"), 12 ("Do

negative comments about work conditions in a company affect your purchase from that company's products?") (Fig. 3) show that consumer decisions and a company's fame are not only affected by a successful marketing campaign. Most consumers would be affected a lot in their purchase by negative comments about the product or by negative comments about the company that makes it or by negative comments about the work conditions.
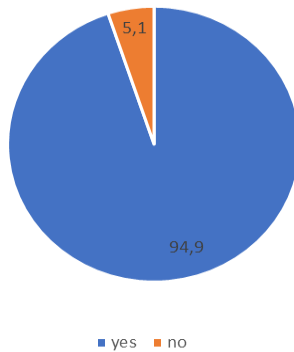

Fig. 2: Search of customer reviews

Fig. 3: Negative comments and purchase behavior

The questions that follow (Fig. 4), examine the same aspects but on the positive side.
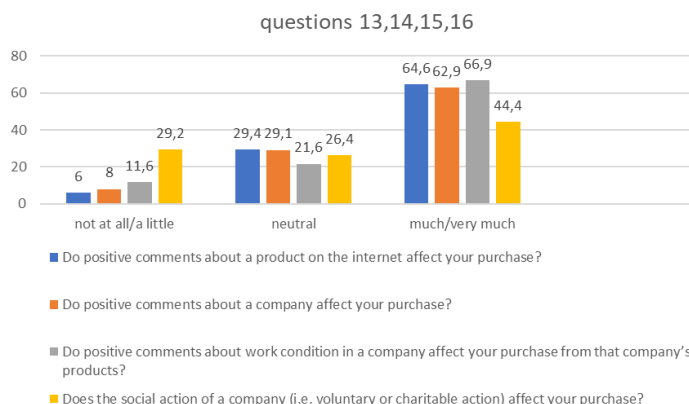

Fig. 4: Positive comments and purchase behavior

Here we should note that an element that plays a critical role in Greece and it is being underestimated from most corporations is the ensuring of good working conditions, not only because this way the employees are more productive but also because consumers focus on the morality of a company, as this research shows. This is an aspect that everyone that is concerned with reputation should consider.

Through question 18 (If a consumer made the following comment: "This product knocked me out" how would you interpret his comment?) it is intended to highlight that polysemy and the language used in social media creates confusion to the users regarding the decoding of the message, since not everyone interprets it in the same way (Fig. 5). Therefore, their management by algorithms that categorize feelings is a great challenge.
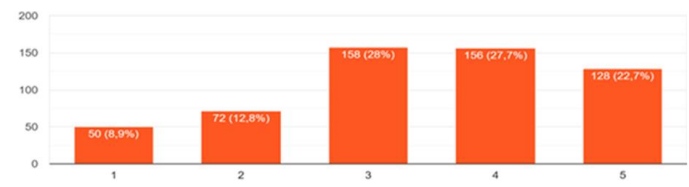

Fig. 5: Language polysemy

We can see that users do not share a unified stance on whether this comment is positive, negative or neutral. The percentages of consumers who would deem it as a negative comment are low. However, the percentages of consumers who would deem it as neutral, positive and very positive are similar. Moreover, the notion of neutrality here should be explored further, since the phrase "it knocked me out" is very emotionally loaded, it is quite "intense", it is not a phrase of the type "the sky is blue", therefore perhaps some of the users made that choice because they could not understand whether it is positive or negative and not because they thought it is neither. It would also be interesting to relate the answer to the age group the user belongs to and compare between the age groups since this particular phrase is part of "the language of the young".

Another type of comment is like/dislike. What is interesting is the way the user perceives their function (Fig. 6).

It is apparent that the user does not have a clear view of what function a dislike has. Maybe the creator of the function had a clear idea, but this doesn't seem to be case for everyone else. We should research on this more, since the 26.6% said they are influenced much/very much is a big percentage. The same goes for the usage of like.

The next question investigates if all comments have the same gravity (Fig. 7). From the answers we get, 55.7% is affected more by the critic of a specialist, 41.8% by the comments of a consumer and a very small percentage by a famous person. This is interesting since many companies hire influencers and other famous people to comment on a product. Maybe more in-depth research is necessary on whether the type of a product

affects this. In similar research in USA, 59% consider the comments of a consumer more reliable than those of a specialist. This difference may be dependent on the passage of time and the fact that the data varies as time passes and from country to country.

In the comment "This advertisement is despicable because of its sexist content", you think that "dislike" refers to the consumer's opinion or to the content of advertisement?
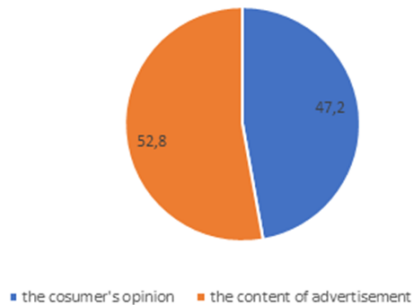

- the cosumer's opinion
- the content of advertisement

Fig. 6: Like/dislike interpretation

Are you influenced more by a online review of

- a consumer
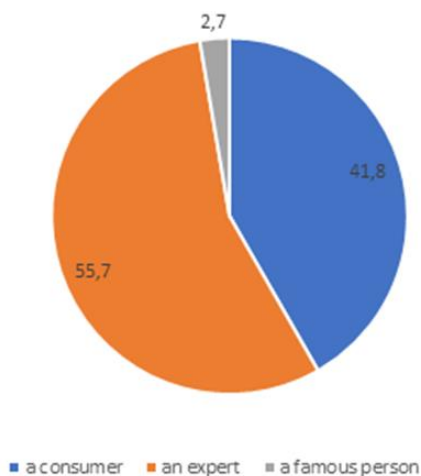- an expert
- a famous person

Fig. 7: Influence

The last question (Fig. 8) confirms the active role consumer comment plays in the shaping of online reputation.
The percentage of consumers that have made a comment or used like/dislike (or any other way of comment) is overwhelming.

V. CONCLUSION, DISCUSSION & FUTURE WORK

Online reputation of a company or a product plays a critical role in the Greek market and it became apparent from this research that consumers play a huge part in its shaping.

A reasonable question that arises is to what degree companies have realised the gravity of the part the consumers play in shaping their reputation. In other countries it is apparent that companies have realised this and most of them have some kind of tools to manage their reputation. English

speaking countries are luckier in this domain since there are more data on the subject and a variety of effective online reputation management tools. The same goes for multinational corporations since in most cases the main language used is English.

Have you ever made an online assessment about a product or a company (by making a comment, using like/dislike or any other way of comment)?

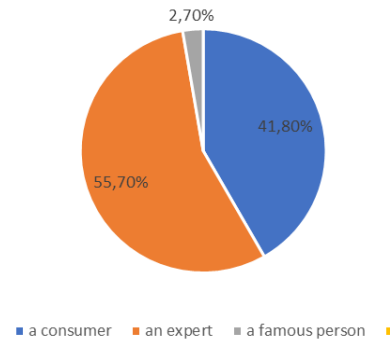- a consumer
- an expert
- a famous person

Fig. 8: Online assessment of reputation

In Greece we have a confusing image about reputation. One characteristic example that proves how the companies underestimate online reputation is e-food. The moment it was made public in social media that working conditions were worsen, their App was pummeled from 4.8/5 to 1/5 in a few hours. Thousands of customers uninstalled the App. The company was forced to reconsider their working conditions policy and at the same time rival companies started advertising their good working conditions in order to attract customers that left e-food. This also proves the results of the question about corporate morality. It is something to be taken into serious account by the corporations, because the disclosure of events, that they could hide or downplay in the past, is very easy thanks to social media and this is a parameter that might determine their reputation.

Online reputation is not a matter that should only concern companies, it should concern customers as well. Many of the techniques that are used seem to try to manipulate public opinion. When negative reviews are hidden on the very last pages of the search engines or when reputation management companies promise to remove negative content, a matter of ethics arises. A tool for the consumers that could find the negative comments would be interesting, but it could turn to a weapon on the hands of rival companies and there is no guarantee that the comments it brings up are reliable, thus the consumer would end up losing.

To make a definition for an abstract concept that is acceptable by everyone is very difficult, the same goes for defining online reputation. On the other hand, defining the basic elements that affect reputation is possible. Our research shows that today's consumers are affected more by the product itself, the brand name and the working environment of the company that produces it. In sort, corporate reputation is an

evaluation of every aspect of a corporation. Therefore, a company wants to have a good picture in the eyes of everyone that is involved with its services: the clients, suppliers, resellers or employees. If a company wants to have successful relationships with the aforementioned parties, good reputation about its ethics is necessary [18].

The previously mentioned are not the only parameters that affect reputation. We must evaluate the factors in a regular basis because it is probable that other aspects of reputation might be more important depending on the trends. For example, more and more consumers are interested if a company is eco-friendly or not than in the past. The defining aspects also vary from country to country since people in different countries have varying values. Also, different factors may apply depending on the product and its target group. All these must be considered.

Still the question "Do all comments have the same gravity?" remains. On one hand with our research, we found that in Greece consumers value expert opinion more. On the other hand, the percentage that was valuing consumer comments was also large. It is certain that if the question was put under the prism of a specific product category, we would have a clearer outcome.

For example, does the comment of someone that watches sci-fi movies fanatically have the same gravity as the comment of someone that doesn't, when it concerns a sci-fi movie? The first challenge we face is to discern and categorize the two consumers. The second challenge is to evaluate the sphere of influence each comment has. It is apparent that comments of both consumer categories give different information and if they were both positive, they could result in making the consumer base of the product larger. All these make the subject very complicated.

Also, what gravity has a comment about the price of a product compared to a comment about its ease of use? Not all aspects should have the same gravity. We must note that the tool Palo.pro and the i-sieve technologies proclaim to have solved this problem. It would be very interesting to examine how they solved this. In general, it would be useful to define which comments should have more value in order to parametrize a system for reputation calculation.

One more topic that remains is whether categorizing comments as positive, negative and neutral is enough. It is true that this categorization doesn't illuminate fully consumer trends. For example, if most of the viewers of a movie found it boring, it is problematic, but it would be more problematic if the viewers were feeling rage because of its content or its contributors. It is clear that we could have a better picture of the reputation about a product or company if we could categorize the comments in a more specific way other than just positive and negative.

Another matter that arises is the trust between users and the reliability of comments. Blockchain technology opens new ways in assuring this reliability. Blockchain is based on consent and digital signatures in order to authenticate the reliability of the data and can also intercept the risk of Sybil attacks preventing situations like forgery and the creation of multiple IDs [19], [20]. In fact, since everyone has access to the history of transactions, it is not possible for a user to provide falsified information in order to obtain a positive outcome for him. At the same time, the provider can migrate his fame to other platforms without losing any or having to rebuild it. Also, the exchange of information can be achieved is a greater degree and a boost is given to new users [19]. Unfortunately, blockchain can ensure this integrity only in its limited ecosystem, but human interaction and trust relationships in a sharing economy are far more diverse and surpass the capabilities that a technological medium can provide [21].

To ensure a satisfactory degree of trust, we must identify the parameters that define trust in the internet ecosystem. Understanding those parameters will contribute to create new tools that will calculate trust more precisely. We must not forget that trust changes depending on the technology and on various social parameters thus it obtains different characteristics.

Admittedly, future research should turn to one of the most demanding subjects which is no other than the extraction and classification of data related to reputation, so that it can be reflected and measured effectively, since many issues remain unresolved and constitute serious challenges. One of the greatest difficulties which creates confusion even during a conversation between native speakers is the ambiguity at syntactic level. Sentences which do not contain any syntactic error may lend themselves to multiple interpretations. For example, in the phrase "I fell by mistake on the child with the bicycle" confusion is created as to whether I hit the child with my bicycle or whether I hit in some way a child which itself had a bicycle.

Furthermore, double meanings are created because of the ambiguity at lexical level. In Greek the word "glossa" (γλώσσα) is used both with the meaning of "language" and with the meaning of "tongue". In the example "His glossa was strange", given that there are two meanings for this word, there is a confusion as to whether the speaker means that strange words were used or whether the man's tongue had something strange because he was ill.

Ambiguity at semantic level must also be mentioned when there are double meanings. For example, in the phrase "his glossa is wooden", if the conversation is about toys, in all probability a toy has literally a wooden tongue. If, however, the comment is made about politics, the word is used figuratively suggesting that some politician or journalist used stereotypical expressions

Fourthly, there is ambiguity at referential level , when it is not clear whom, where or what the sentence refers to. For example, in the sentence "Kostas was talking to Giannis, who had just arrived", it is not clear who of the two had just arrived.

Finally, ambiguity at pragmatic level can be found in the

sentence "He went abroad a long time ago". The temporal phrase "a long time ago" is unclear and may be interpreted differently by different speakers. Obviously, these various ambiguity types can co-exist even in just one sentence.

At any rate, another challenge is for the extracted words to be relevant with the topic each user explores. The sources are now infinite and if the results of the extraction of feelings are not relevant with the topic it is unbelievably time consuming and ineffective to separate between relevant and non-relevant ones. It is true that the use of dictionaries is weaker in this sector, whereas the methods of mechanical learning are more effective.

Another challenge is to correctly manage negative words that can completely turn around the meaning and the polarity of feelings. For example, in the sentence "no one rejects the view that…" the existence of two negatives (no, rejects) results in a positive polarity, since it is suggested that "everyone agrees with the view that…".

A lot of times expressing an opinion does not involve opinion words. In the sentence "The exam of the lesson lasts only three hours", the word "only" expresses an opinion without it being an opinion word. Indeed, it can express positive polarity, if someone is happy that the duration of the exam is short, or for the same reason they could be stressed because of this fact.

Irony is a great challenge as far as its management is concerned because it can often be difficult to detect, even if the context is rich. For example, in the following opinion piece the writer is ironic about multinational companies, in an effort to raise citizens' awareness about the subject of child labor, which cannot be understood by all the citizens: "Benetton is neither worse nor better than the rest of the rulers of multinational companies: Nike, Adidas, Fiat etc. The company follows the laws of the free market, as everyone does, moving its production where labor cost is lower – where labor rights are minimal to non-existant. And if in these countries there are babies going to work, the respectable capitalists of the civilized West are not to blame. The legislation of the underdeveloped countries are to blame, the barbarian parents of the Third World are to blame for making their children work". Some readers think that indeed the legal framework of the Third World countries and the children's parents bear most of the responsibility, therefore they cannot see that the writer criticizes the multinational companies and West's stance on the matter through irony. As a result, there is also the issue of point of view. A simpler example, that has not to do with irony but that showcases that point of view plays a role, is the following one. The phrase "new changes in the way students are evaluated" can be deemed neutral. However, when experiencing the Greek educational reality, it can be deemed as negative, since in recent times changes are made all the time in a fragmented way and as a result multiple problems arise. Still, it can be deemed as something positive given that the changes made until now were not satisfactory, so one could be happy that new changes are made with the hope that the educational system will thus be upgraded. Returning to irony, it must be stressed that even the cultural framework can play a decisive role. For example, it is not certain that someone Greek would register the sense of irony of someone English. Irony and sarcasm are directly linked to how every person and every culture perceives the world, which is why differentiations occur regarding their humor, etc. Therefore, a model which has been trained on the basis of the English language would detect ironic phrases in Greek less effectively.

The extraction of feeling from material on social media, forums etc. faces additional challenges because there is a high level of "noise" which must be managed. Most of the times posts are short either because the media themselves impose limits, such as Twitter where a post can be up to 140 characters, or due to the nature of communication in these media. The limited size makes the detection of the feeling polarity more difficult. In addition, in the effort to resemble live communication, they offer the possibility of direct messages exchange and of informal conversation, as a result users are not interested n the accuracy of the applied grammar and syntactic rules, creating thus high levels of noise.

At the same time, everyday vocabulary and slang words are used, as well as deliberate language alteration for the purpose of directness or for other purposes (this is a common phenomenon in "the language of the young"), for example "cu" (instead of see you). Furthermore, even greater confusion can be created by the use of greeklish since the word "τέλειο" (meaning "perfect") can be written either as "teleio" or "telio". Also, in the phrase "exo faei kolima", the word kolima could mean "κόλλημα", i.e. I like something very much, I am obsessed with it, or "κώλυμα", i.e. I have encountered some setback.

A lot of users use capital letters instead of pejorative ones, with no reason, but their interlocutors often think that they are "shouting". For example, in the phrase "I REMIND YOU TO DO THE EXERCISES", it could be that the user happened to use capital letters and their students had the impression that the user is "shouting" at them, that this is uttered in a menacing, emphatic tone. The same applies to the elongation of words or phonetic characteristics. In the phrase "Whaaaaaat happened?", "Nooooooo" it can be perceived that the user wants to emphasize their emotional state but it is not immediately apparent what this is. The phrase "Nooooooo" could show irony (Nooooooo=I can't believe you), impatience (Nooooooo=I can't wait to see you), anger (Nooooooo=Come at last, I've been waiting a long time). Punctuation marks used as commentary can also create double meanings. For example, in the phrase "What can I tell you… This product is amazing!", the ellipsis and the exclamation mark may be interpreted as enthusiasm but also as irony.

Among these media is the often use of emoticons to convey sentiments. A problem arises with detecting emoticons since there are many versions of one emoticon and many new are created regularly, the same difficulty arises from the fact that they contain punctuation marks, spaces etc. On the other hand,

there are strings that resemble emoticons, but they are actual words. For example, the emoticon ":p" could be found in a sentence like "…:play…". Also, the use of a positive emoticon doesn't always mean something good. As an example, we have the hashtags #Minister#Resign#<3, the heart at the end doesn't negate the negative meaning of the message. Decrypting an emoticon can't always be easy and this will be shown in this research.

Another issue that arises is that of multilingualism. This problem has 3 parameters. On the one hand, it is easily understood that a tool for reputation management developed for the English language cannot function effectively for a company that operates in Greece, since there is a multitude of differentiations in the language that users use in Greece, at every level. On the other hand, Greek users use English words as well, something which creates additional "noise". Thirdly, as far as multinational companies which operate in different countries are concerned, it is logical that on the same platform, for example under a video on YouTube, the users' comments will be written in different languages.

When extracting sentiments there is one parameter that is left out, and that is the frame in which people evaluate information. This frame is determined by age, sex, cultural background, the social frame in which an individual is living in, the work he/she tries to do and many more. A person isn't in an empty frame, his sentiments and thoughts are affected by multiple factors and those factors have to be taken in consideration when trying to extract sentiment.

It is also interesting that the lack of extralinguistic and paralinguistic elements of text messages makes the interpretation of the message more difficult in many cases. Certainly, at the same time there is infinite multimedia material with images, sound, video, emoticons, and maybe in the future more possibilities will be added which cannot yet be imagined. Finally, it should be noted that the language used by someone reflects cultural and social elements and at the same time each language has its own specificities, therefore it is very difficult for a tool which was made based on English to be effective for all languages. Of course, the individual and social factors that affect both the content and the form of the message expressed by the user should not be ignored.

There are many aspects that someone must focus on in future research about online reputation. Their results will help improve our existing tools to measure online reputation and create new tools as well.

References

[1] Chaudhuri, A., & Holbrook, M. B. (2002). Product-class effects on brand commitment and brand outcomes: The role of brand trust and brand affect. Journal of Brand Management, 10(1), 33–58. https://doi.org/10.1057/palgrave.bm.2540100

[2] Proserpio, D., & Zervas, G. (n.d.). Online reputation management: Estimating the impact of management responses on consumer reviews, 2017.

[3] Godes, D., & Silva, J. C. (2012). Sequential and Temporal Dynamics of Online Opinion. Marketing Science, 31(3), 448–473. https://doi.org/10.1287/mksc.1110.0653

[4] Smith, J. (2012). The companies with the best CSR reputations. Forbes Magazine.

[5] Bolton, G., Greiner, B., & Ockenfels, A. (n.d.). - Reciprocity in the Production of Reputation Information, 2013

[6] Cui, G., & Guo, X. (2009, July). The impact of online word-of-mouse-Sales of New Products at Amazon. Com. In International Conference on e-Business (Vol. 1, pp. 143-150). SciTePress.

[7] Fradkin, A., Grewal, E., & Holtz, D. (n.d.). Reciprocity in Two-sided Reputation Systems: Evidence from an Experiment on Airbnb, Marketing Science, 2019

[8] Li, X., & Hitt, L. M. (2008). Self-Selection and Information Role of Online Product Reviews. Information Systems Research, 19(4), 456–474. https://doi.org/10.1287/isre.1070.0154

[9] Dellarocas, C., & Wood, C. A. (n.d.). The sound of silence in online feedback: estimating trading risks in the presence of reporting bias, Management Science, Vol. 54, No. 3, p.p. 460–476, 2008.

[10] Dini, F., & Spagnolo, G. (2009). Buying reputation on eBay: Do recent changes help? International Journal of Electronic Business, 7(6), 581. https://doi.org/10.1504/IJEB.2009.029048

[11] Tavakolifard, M., & Almeroth, K. C. (2012). A Taxonomy to Express Open Challenges in Trust and Reputation Systems. Journal of Communications, 7(7), 538–551. https://doi.org/10.4304/jcm.7.7.538-551

[12] Cambria, E. (2016). Affective Computing and Sentiment Analysis. IEEE Intelligent Systems, 31(2), 102–107. https://doi.org/10.1109/MIS.2016.31

[13] Petasis, G., Spiliotopoulos, D., Tsirakis, N., & Tsantilas, P. (2014). Sentiment Analysis for Reputation Management: Mining the Greek Web. In A. Likas, K. Blekas, & D. Kalles (Eds.), Artificial Intelligence: Methods and Applications (Vol. 8445, pp. 327–340). Springer International Publishing. https://doi.org/10.1007/978-3-319-07064-3_26

[14] I. Syllaidopoulos, A. Skraparlis, K. Ntalianis, Evaluating Corporate Online Reputation through Sentiment Analysis of News Articles: Threats, Maliciousness and Real Opinions, International Journal of Cultural Heritage, Vol 7, p.p. 8 -22, 2022

[15] M. S. Katsika, K. Ntalianis, F. Ntalianis, I. Salmon, disquisition, emergence and calculation of prominent personalities influence on twitter-a case study, Proceedings of 4th International Conference on Quantitative, Social, Biomedical and Economic Issues, 2020

[16] N. Tsapatsoulis, V. Anastasopoulou, K. Ntalianis, The central community of Twitter ego-networks as a means for fake influencer detection, 2019 IEEE Intl Conf on Dependable, Autonomic and Secure Computing, Intl Conf on Pervasive Intelligence and Computing, Intl Conf on Cloud and Big Data Computing, Intl Conf on Cyber Science and Technology Congress (DASC/PiCom/CBDCom/CyberSciTech), p.p. 177 -184, 2019

[17] K. S Ntalianis, A. Kener, J. Otterbacher, Feelings' Rating and Detection of Similar Locations, Based on Volunteered Crowdsensing and Crowdsourcing, IEEE Access, Vol. 7, p.p. 90215-90229, 2019

[18] Gray, E. R., & Balmer, J. M. T. (1998). Managing Corporate Image and Corporate Reputation. Long Range Planning, 31(5), 695–702. https://doi.org/10.1016/S0024-6301(98)00074-0

[19] Almasoud, A. S., Hussain, F. K., & Hussain, O. K. (2020). Smart contracts for blockchain-based reputation systems: A systematic literature review. Journal of Network and Computer Applications, 170, 102814. https://doi.org/10.1016/j.jnca.2020.102814

[20] Daimi, K., & Peoples, C. (Eds.). (2021). Advances in Cybersecurity Management. Springer International Publishing. https://doi.org/10.1007/978-3-030-71381-2

[21] Möhlmann, M., Teubner, T., & Graul, A. (2019). Leveraging trust on sharing economy platforms: Reputation systems, blockchain technology and cryptocurrencies. In R. Belk, G. Eckhardt, & F. Bardhi, Handbook of the Sharing Economy (pp. 290–302). Edward Elgar Publishing. https://doi.org/10.4337/9781788110549.00033.