Tech for a Better Planet: A Corpus-based Analysis of the Environmental Disclosure in CSR Reports of Huawei

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Abstract. The CSR report, as a way for stakeholders and the public to understand and audit a company’s practices of social responsibilities, plays an increasingly important role in the construction of the corporate image. Aimed at exploring how Huawei addresses global environmental issues and constructs its green and responsible image as a business, this paper studies the environmental disclosure in Huawei’s CSR reports from 2010 to 2019. Taking Halliday’s Systemic Functional Linguistics (SFL) and Kress and van Leeuwen’s visual grammar as theoretical frameworks and the corpus software AntConc as the analytical tool, this study tries to investigate how the language and images are used to convey Huawei’s environmental concept and build its identity. It is shown that Huawei, by using words and images related with nature, energy conservation as well as green products, highlights the role of technology in solving environmental problems to leave the public an impression of a responsible corporate. However, Huawei doesn’t perform well in terms of guiding the public to participate in natural protection because people’s environmental role is marginalized and natural problems are hedged in the reports. It’s hoped that the findings can help companies to construct their environmental reports more effectively which will not only promote their reputation but also guide the public to protect the planet.

1. Introduction
With the rapid development of the global economy, our natural environment is deteriorating, which has threatened the survival and development of human beings and other species. Such ecological problems as climate change, resource depletion, water pollution, destruction of biological diversity have aroused the attention of the whole society. Facing this increasing concern, the company, viewed as one of the main contributors to environmental problems, has to respond and take the right actions accordingly to maintain its reputation and survive in the competitive market. One strategy the company adopts is releasing corporate social responsibility (CSR) report to disclose its sustainability performance.

CSR, which originated in the 1950s, has gained popularity in recent years. The studies related with CSR reports generally concern the information disclosed\(^1\), the strategies employed\(^2\), the criteria considered\(^3\), the relation between the report and the performance as well as the values of the company\(^4\), and the evaluation system\(^5\). In terms of discourse analysis of the CSR report, some scholars, mainly focusing on heavy-polluted sectors, examined the linguistic features and rhetorical strategies used in the report to construct the socially responsible agent\(^6\).

So far, few studies have been conducted about the CSR reports of information and communications technology (ICT) industry. While recognizing its contribution to network connections, we should also
note that ICT infrastructure and smart devices do consume amounts of energy and resources, including Huawei. Obviously, how to structure and detail the CSR report and what ecological concept is conveyed are of great significance for the corporate reputation and future development.

This paper gives a multimodal analysis of environmental disclosure in CSR reports of Huawei from 2010 to 2019 to explore how Huawei addresses environmental issues, what and how its ecological concept is expressed. Specifically, the study, after presenting the introduction and methodology, will discuss the environmental disclosure from two aspects, visual analysis and textual analysis. In terms of visual analysis, images found will be classified and analyzed based on the grammar of visual design proposed by Kress and van Leeuwen. As for textual analysis, a corpus software, AntConc, will be employed to analyze the collected data according to Halliday’s functional linguistics. Finally, this paper will summarize the major conclusions and present several suggestions. Hopefully, the findings can help companies to convey their environmental performance more effectively and guide the public to protect the earth together.

2. Materials and methods

2.1. Data collection

Since this study mainly focuses on finding out how Huawei addresses global environmental issues and constructs its green and responsible identity, the environmental disclosure in CSR reports (2010-2019) is chosen as data. Huawei, as a leading global provider of ICT infrastructure and smart devices committed to bringing digital to every person, home and organization, has begun to release its CSR reports to disclose its sustainability practice since 2008. Environmental protection is one major area of its sustainability strategy. Huawei, who is highly aware of its environmental impact, has set environmental goals and strategies based on the UN’s Sustainable Development Goals (SDGs) while rationally analyzing its environmental challenges and risks. What’s more, it also details its environmental cases or stories such as reducing carbon emissions, promoting renewable energy and contributing to a circular economy in the CSR reports.

To ensure the authority of the data, ten CSR reports from 2010 to 2019 were downloaded from Huawei’s official websites https://www.huawei.com/en/ in the first week of September of 2020. The researcher then collects information about environmental information in CSR reports, including texts and images. It should be noted that tables, graphs and charts are discarded, for they show objective realities and not suitable for visual analysis[6][7]. In total, 151 images were selected, marked and classified.

| Year | Word Types | Word Tokens | Images |
|------|------------|-------------|--------|
| 2010 | 1185       | 4453        | 5      |
| 2011 | 971        | 3745        | 8      |
| 2012 | 1401       | 6503        | 14     |
| 2013 | 1167       | 4846        | 13     |
| 2014 | 1329       | 5763        | 21     |
| 2015 | 1562       | 6897        | 18     |
| 2016 | 1356       | 5370        | 9      |
| 2017 | 1251       | 4756        | 16     |
| 2018 | 1273       | 5453        | 14     |
| 2019 | 1728       | 8317        | 33     |
| TOTAL| 4253       | 56,103      | 151    |

After images were identified, this study created a corpus for textual analysis using AntConc. The corpus contained ten text files that were compiled and cleaned in the order of the year. The size and characteristics of the corpus are shown in Table 1. Here, “word token”, the smallest possible unit in a
corpus, generally means the “word” we usually use, while “word type” means “word form”. In a certain text, a word which appears several times will be counted only once. In terms of statistical reliability, the corpus of this study with 56,103 word tokens is significant for analysis according to De Hanan[8], who argues that when the corpora contain more than 20,000 words, the research results on frequency and distribution are reliable[6].

2.2. Data analysis
Based on Kress and van Leeuwen’s visual grammar and Halliday’s functional grammar, this paper will analyze the collected data in two levels.

At the first level, according to the visual grammar, each picture will be identified in terms of the participants[6], which include nature, technology, people as well as a mix of two or three of them. Identifying the participant will help the researcher determine the main topics being represented. For the mixed picture, the study will take salience into account, figuring out which participants were placed in the foreground. It should be pointed out that at this stage, the connotation of technology will be particularly analyzed. Later, the dominant color(s) of each image will be examined to dig out the hidden meaning.

At the second level, the researcher will employ AntConc to find out the linguistic features of the corpus. In the beginning, the Word List tool will be used to identify the 50 most frequent notional words. Doing this, the researcher can spot the salient lexical occurrences, which will be expanded and observed in context with the Concordance tool. Then certain frequently occurring and salient words will be explored in terms of their frequent collocates by the Collocates tool. Besides, to guarantee the significance of statistics, this paper will also perform a log-likelihood test for frequencies and those lower than 6.63 will be filtered [9].

3. Results & Discussion
According to the research, Huawei is more and more conscious of the need and responsibility to address environmental problems. It has reserved one section in CSR report to narrate its environmental practices. Also, in the sustainability management part, it releases its environmental honors and awards, risks and challenges, opportunities, strategies and targets. It is worth mentioning that Huawei has disclosed its negative environmental impacts in the report including such details as how much CO2 emission has been produced, although such negative information is always followed by the solutions and improvement figure.

This indicates Huawei has tried best to publish its environmental information in compliance with the international and government standards, which is not the case shown by previous studies, which argue that Chinese businesses tend to disclose charity information while ignoring the publish of environmental information[10] and Chinese contractors’ CSR communication was the poorest in all dimensions and issues[11]. Therefore, compared with the previous studies, Huawei’s practice is an improvement as for environmental disclosure. In addition, such comprehensive disclosure can promote the corporate image, which can be suggested by the increasing profits and awards gained by Huawei. In the following part, visual analysis and textual study will be carried out to explore how Huawei address environmental problems and construct its reputation.

3.1. Visual analysis
According to Kress and van Leeuwen[7], the conception and presentation of images can influence how people perceive reality. In order to study the meaning of images, they put forward a multimodal approach to communication, visual grammar, which analyzes images from three dimensions: representational, interactional and compositional meaning. This study will only explore the representations and compositions, specifically, the participants, topic and salience. Also, the dominant color(s) will be taken into account[7].

As shown in Table 2, technology is the main topic in images. Pictures taking technology as the single participant account for 58.94%, far more than other participants. If considering the mixed
images including technology, the proportion will increase to nearly 70%. In terms of salience, technology is usually placed in the foreground or combined with other participants in the foreground with 14 cases, 73.68% of the total (see Table 3). For example, in image 1, the wind turbine is foreground with the mountain as the background. By contrast, people appearing as the participant in the images only occupies 19.87% while that of nature is 14.57%. Actually, nature and people rarely appear as the single salience. Instead, they are always shared with technology as shown in image 2. Finally, as far as the connotations implied in all the images containing technology, there is no negative connotation created at all. All of the pictures evoke a positive association with technology, such as the green forest, clean air and diversified species.

Table 2. The topic of images (Participants)

| Topic                  | Number of images | Percentage (%) |
|------------------------|------------------|----------------|
| Nature                 | 9                | 5.96           |
| Technology             | 89               | 58.94          |
| People                 | 16               | 10.60          |
| Nature/technology      | 5                | 3.31           |
| Nature/people          | 5                | 3.31           |
| Technology/people      | 6                | 3.97           |
| Nature/technology/people | 3              | 1.97           |
| Others                 | 18               | 11.92          |
| Total                  | 151              | 100            |

The findings show that Huawei emphasizes the role of technology in solving environmental problems. What’s more, Huawei also conveys that such technological development as clean energy products and monitoring systems can help to build a harmonious planet. However, while technologies are heavily promoted, it should be noted that nature is marginalized and people’s role in protecting the environment is weakened and becomes passive. They basically represent the users of technology.

Table 3. The salience of participants in the mixed images

| Topic                                               | Number of images | Percentage (%) |
|-----------------------------------------------------|------------------|----------------|
| Nature is placed in the foreground                  | 1                | 5.26           |
| Technology is placed in the foreground              | 7                | 36.84          |
| People are placed in the foreground                 | 1                | 5.26           |
| Nature and technology are both placed in the foreground | 2              | 10.53          |
| Nature and people are both placed in the foreground | 3                | 15.79          |
| Technology and people are both placed in the foreground | 3              | 15.79          |
| Nature, technology and people are placed in the foreground | 2              | 10.53          |
| Total                                               | 19               | 100            |

Image 1. 2016 CSR report of Huawei

Image 2. 2019 CSR report of Huawei

Regarding the color, blue and green are widely used in the images, which take up to 39.07%. According to Kress and van Leeuwen[6][12], blue and green can induce the viewers to associate with
nature and ecology, while white and brown can give them an impression of a beautiful environment, like the tree, ice, or snow. A combination of the above four colors occupies a high proportion, 63.57%. In terms of connotations, all of the colors invoke a positive impression and association. Through detailed observation, it is also found that no image depicts such natural problems as water pollution or climate change. Through such visual design, Huawei attempts to tell the public that it is protecting the environment and making the earth beautiful. Nevertheless, it may misguide the public to ignore the natural problems and risks which the planet is actually facing and needs immediate actions.

Table 4. Dominant color(s) in the images

| Color(s)      | Number of images | Percentage (%) |
|---------------|------------------|----------------|
| Blue          | 33               | 21.85          |
| Green         | 26               | 17.22          |
| White         | 19               | 12.58          |
| Brown         | 11               | 7.28           |
| Black         | 9                | 5.96           |
| Grey          | 12               | 7.95           |
| Blue/green    | 12               | 7.95           |
| White/Brown   | 4                | 2.65           |
| White/black   | 2                | 1.32           |
| white/blue/green | 3       | 1.99           |
| Other         | 20               | 13.25          |
| Total         | 151              | 100            |

3.2. Textual analysis

In the above visual analysis, we concluded that Huawei is highlighting the role of technology in dealing with the environmental issues and constructing its green image and reputation, which, however, places people in a passive position to tackle the natural problems. In the following part, the study will further prove the findings based on SFL, which stresses language can construct the world and highlights linguists’ social accountability [13].

By using the Wordlist tool, we find the words “product”, “technology”, “materials”, “management”, “solutions”, “network”, “ICT”, “mobile”, “system”, “development” “recycling” are among first 50 most frequent notional words. These words all represent Huawei’s technological solutions, that is, taking its advantage of the digital network and strict management system to address the environmental issues. What’s more, when expanding these words to their contexts for detail by Concordance tool, we find that the words “green” “sustainability” “eco-friendly” “reducing” “energy-saving” are always used in the context, which will give the readers a positive association that technology is green and of great help to effectively solve the current ecological problems. This can be further proved by examining other frequently occurring words. “Green” “environmental”, “reduce”, “conservation” and “efficiency” are among the 25 most frequent notional words, which indicate Huawei is seeking to minimize its environmental impacts and protect the planet as a responsible business. Thus, its green image is constructed.

It has been discussed previously that Huawei’s ecological impacts mainly come from its consuming huge amounts of energy and resources. This offers a reasonable reason why “energy” and “emission” are among the 5 frequent notional words. This study then adopts the Collocates tool to figure out what are the frequent collates of them used in the reports. As revealed in Table 5, energy tends to be modified by words like “conservation”, “efficiency”, “clean” and “renewable”, by which Huawei intends to show it is actively seeking green solutions and contributing to a clean and efficient economy.
| Collocate  | Frequency | Log-likelihood  |
|-----------|-----------|----------------|
| Conservation | 169       | 1256.35925     |
| Efficiency     | 117       | 705.43947      |
| Saving          | 74        | 466.35786      |
| Management      | 83        | 370.64199      |
| Reduce          | 67        | 255.67038      |
| Clean           | 28        | 148.9291       |
| Renewable       | 26        | 145.2616       |

When it comes to the word “emission”, “CO2”, “carbon”, “GHG” and “reduction” are the first four notional words that “emission” is most frequently matched with. At first sight, the words “CO2”, “carbon” and “GHG” give people a negative association of air pollution and energy waste. However, if we use the Concordance tool to do a detailed observation, it reveals they always occur in the context with words “reduce”, “lower”, “cut”, “identify”, which totally change people’s first impressions. Instead, they will positively think Huawei, facing such emission troubles, is proactively contributing to the SDGs, which can be also proved by the frequent collocates “reduction” and “reducing” of “emission”. Thus, its corporate reputation is promoted.

| Collocate  | Frequency | Log-likelihood  |
|-----------|-----------|----------------|
| CO2       | 84        | 757.37856      |
| Carbon    | 101       | 7 729.24559    |
| GHG       | 41        | 336.02058      |
| reduction | 69        | 512.35026      |
| Reducing  | 12        | 49.01546       |

Concerning people, the study finds that “Huawei” and “we” are the second and third most frequently used notional words in the corpus with a frequency of 842 and 647 respectively. Such heavy use of the two words puts Huawei company at the central place to deal with environmental issues. However, “people” in the reports are generally referred to as “customers” or “consumers”, not the “protector” or “citizen”. It should be noted that “citizen” is used 2 times in the corpus, but it stands for Huawei, who compares it as a responsible citizen. On the one hand, this distribution does enhance Huawei’s green reputation. On the other hand, the role of the people in environmental protection is marginalized. From this perspective, we can see Huawei, as an influential ICT company, still has a long way to go as for guiding the public to protect the planet.

4. Conclusion
Aimed at exploring how Huawei addresses environmental issues and builds its reputational image, this paper has carried out a multimodal analysis of the environmental disclosure in Huawei’s CSR reports from 2010 to 2019. The study shows that Huawei is aware of environmental problems and the significance of environmental disclosure to the credibility and development of the company, for it has released comprehensive and detailed environmental information in CSR reports.

Through visual and linguistic analysis, it is revealed that Huawei highly values the role of technology in tackling ecological problems. What’s more, through adopting nature-related and eco-friendly pictures and lexical words, its environmental performance and stories appear convincing, which will help it construct a green corporate identity in the eyes of stakeholders and the public. However, as for calling for the people to participate in environmental protection, Huawei doesn’t prove its guiding role as people have been placed at a passive role and natural problems are weakened in the reports.

Based on the above analysis, this study tries to present the following suggestions for companies to better address environmental problems. Firstly, companies should develop a specific section for detailed and well-designed environmental disclosure to explain their environmental impact, strategies
and so on. Also, they should properly use language and appealing pictures so as to attract the stakeholders and the public, ultimately promoting their reputation. Secondly, companies should play a leading role in guiding the public to actively participate in environmental practice. This can be realized by adding the pictures and language which show the natural degradation and emphasize the people’s active role in ecological protection.

Hopefully, this paper can give some hints for companies to better perform environmental practice as well as construct a responsible and green image. However, there are still some limitations in this paper. Even though the CSR reports of ten years have been chosen as the data, the size is still limited as for the whole sector or the global market. Moreover, this study didn’t conduct a comparative analysis by contrasting Huawei with other companies. It is advisable that in the future, similar studies may enlarge the corpus and carry out a contrast study.

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