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A STUDY ON THE ROLE OF GRAPHIC DESIGNERS FOR REDUCTION OF DIGITAL CARBON FOOTPRINT

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ABSTRACT

Environmental concern is a cognizable topic in current days; almost every industry has initiated to put positive effort into dealing with the negative impact of the production and consumption. Digitalization is being practiced as a better outcome, but it also significantly affects the environment. CO2e has been identified as a pollutant through digital procedures caused by digital carbon emission. Almost half of the population is online, so it is becoming increasingly common to broadcast advertisements for better communication, which is one of the most contributing practices to carbon emissions. The maximum data transmission frequency is a driving key for the digital carbon footprint. The other significant key drivers are size, dimension, resolution, and color application in the graphics, which are the essential elements of graphic design. Therefore, it is a natural question what the role of graphic design in can be minimizing carbon emissions and what measures a graphic designer can take as a responsibility. After recording the in-depth opinions of designers and students, an attempt was made to outline the influential factors for the responsibilities of graphic designers to reduce the digital carbon footprint to elicit an answer to the above question.

Keywords: Digital Advertising, Graphic Design, Carbon Footprint

1. INTRODUCTION

The increasing dependence on digital has made all office and personal work easier. Almost half of the world's population is enjoying Internet services today. Due to this, the internet, digital devices, and the energy consumption is happening as if it is unlimited. While the reality is that nothing is limitless Osborn (1954) Meadows et al. (2004) everything in the world is connected to something, whatever is consumed must go somewhere, no resource in this world is free, and nature knows what is best Commoner (1972) As a result, humankind is facing environmental ill-

effects only through digital consumption. The aftermath of maximum usage of digital and electricity consumption has been termed a digital carbon footprint by researchers and environmentalists. Hardly any sector is untouched by a digital platform, be it the exchange of information or the consumption or purchase of any item. The presence of millions of people in the digital world has emerged as such a convenient opportunity for the marketers, through which the launching, promotion, selling, and distributing of products became a very effective medium. In this way, the triumphant entry of advertisements took place on digital platforms, and its size soon became huge. Its expansion is continuously happening, and in the future, it will emerge as a leading and necessary medium for advertisements. The concern here is the contribution of advertisements to the digital carbon footprint.

The increasing use of advertisements for marketing expansion has made the graphic designer's role necessary. In such a situation, if we talk about the environmental side effects caused by digital advertising Kingaby (2021) then the personal views of the graphic designer are critical. These considerations will be responsible for creating the overall dimensions of such advertisements to reduce the carbon footprint. Furthermore, the skilful creation of the graphic designer is the source of advertising success; the designer is the driving force behind the creation of the entire creative scene. Therefore, the graphic designer is responsible for the intensity of energy consumption in the transmission of a graphic design prepared for an advertisement.

Based on all these arguments, a graphic designer can be expected to construct a cheerful design in an environmental context. However, the digital carbon footprint, a universal problem, and challenge to address, will only increase in the future; how can digital advertising neutralize the carbon footprint? Therefore, a researched discussion on this fact is necessary. In this context, this research has been done to identify a graphic designer's responsibilities in reducing carbon footprint.

2. LITERATURE REVIEW

Internet consumption requires a massive amount of energy and results in the emission of CO2e. The use of the internet in large quantities according to the needs has made on line's role in the global carbon emissions significantly. According to Pärssinen et al. (2018) now measuring the exact quantity is fraught with challenges; Because of all the complexities on the internet. Although how much a software company emits is quantifiable, it must also include the energy consumed by each individual to measure the consumption over the entire use cycle, who would have chosen electric resources to use the internet. In such a situation, measuring the total carbon emissions from advertisements transmitted online is difficult. However, researchers have proved by the researchers Andrae and Edler (2015) that every second spent on the internet is responsible for the carbon footprint, and the amount is much higher. If universal Internet consumption is taken together, it is also a global problem.

Braun and Moe (2013) have stated that a marketer must present an effective advertisement for broadcast on the internet. This is because millions of people are present on the internet, but the advertisements broadcast is personalized, so the most effective advertising depends on individual impressions. Furthermore, creativity needs to be presented positively by the designer. So, when environmental issues are addressed in advertising, their sensitivity becomes essential. Therefore, the consumers believe in checking the veracity of the claims in the advertising. In such a situation, it is not only the advertising messages that matter, but how often they are being broadcast, how the graphic design of the advertisement is, and how

much it is accountable to digital carbon emissions is an essential factor. Therefore, it is vital to determine the graphic designer's role and responsibility in reducing carbon emissions from advertisements.

3. DATA COLLECTION AND METHODOLOGY

A qualitative method has been adopted for the study, for which interview was chosen as a medium of data collection; so that, the subjective views and opinions of the respondents can be analysed. Only Graphic Designers or Graphic Design students were selected for the compilation of responses, and the necessary criteria were set for their selection.

1) Be an active graphic designer or graphic design student.
2) They should have prior knowledge of digital carbon footprint and environmental problems.

Table 1

Table 1 Interview participants profile S.No. Gender Age Profession

S.No.	Gender	Age	Profession	State
1	Male	35	Graphic Designer	Tamilnadu
2	Male	23	Graphic Designer	Kerala
3	Male	17	Graphic Designer	Bihar
4	Male	34	Graphic Design Student	Madhya Pardesh
5	Male	20	Graphic Designer	Uttar Pardesh
6	Female	20	Graphic Design Student	Uttar Pradesh
7	Male	17	Graphic Designer	Uttar Pradesh
8	Female	20	Graphic Designer	Maharashtra
9	Male	23	Graphic Design Student	Maharashtra
10	Female	19	Graphic Design Student	Uttarakhand
11	Male	24	Graphic Designer	Uttar Pradesh
12	Male	21	Graphic Designer	West Bengal
13	Female	22	Graphic Designer	Uttar Pradesh
14	Male	21	Graphic Design Student	West Bengal
15	Female	23	Graphic Designer	Uttar Pradesh
16	Male	23	Graphic Designer	Punjab
17	Female	20	Graphic Design Student	Uttar Pradesh
18	Female	18	Graphic Designer	Uttar Pradesh
19	Female	21	Graphic Designer	Uttar Pradesh

The selection of respondents for interviews was made individually by the author. However, due to the lack of prior knowledge of the digital carbon footprint of graphic designers, it was first ensured that graphic designers and graphic design students were made aware. For this, a total of 6 virtual lectures were organized weekly. Finally, a three-day workshop was also organized so that they could fully understand the digital carbon footprint and its related elements. After this, 30 graphic designers and design students were interviewed from among them identified and coming in the criteria.

While doing the interview, it was also ensured that there was an appropriate sample size for the study. The main objective of the interview was to gain new insight. Tallon and Kraemer (2007) observed that there is no need to conduct further interviews once the theoretical saturation is reached. According to Guest et

al. (2006) usually theoretical saturation can be obtained from 12 samples of any homogenous group. Due to the efforts made for the previous study, 30 participants were found, and the age group of 20 to 35 years was marked to form a homogenous group. There were 11 out of 30 participants were either 20 years old or over 35, so their responses were not included in the study. In the end, the opinions of 19 participants were analysed. The profile of all 19 participants is given in Table 1

All these participants belong to different geographical locations. Eight participants among 19 were female. English and Hindi, both languages, have been utilized for conducting the interview. All the interviews were conducted virtually, and each took half an hour on average. Data has been analysed manually on the initial level. After that, a supportive tool (Nvivo Pro 12 - software) was utilized for qualitative analysis to ensure validity.

4. RESEARCH FINDINGS

Some significant and valuable points have been generated from the in-depth interaction with the participants, which have been categorized as follows:

4.1. AWARENESS OF DIGITAL CARBON FOOTPRINT

Before any practice, it is essential to have complete and accurate information about it, and the sources of such information can be many. However, it can be possible only when there is awareness. For example, in the initial phase of this study, when graphic designers were interviewed about the carbon emissions from graphic design for advertisements, it was found that they were unaware of it. They were then communicated to provide pertinent information; after that, the same group advised that being aware and doing is imperative for this subject. For intense, a 21-year-old female graphic design student expressed, “I felt that unknowingly I just wasted so much energy, but now I understand it, and I make sure that as much as I can spread awareness, I will.” This statement emphasizes that graphic designers understand their responsibility to the environment and want to be sensitive and proactive about their successful role. But, in the absence of information, they do not know how much damage it has caused to the environment in the past; How much damage they are causing to the environment every day and they are also unacquainted of this.

At the same time, the birth of a new idea about how significant small changes in the design can make a difference is also possible only when he is aware of all the facts related to the carbon footprint. Surprisingly, it was noted after the workshop that the participants felt that the information translated through the workshop (held to train about the digital carbon footprint by graphic design) as a new term of graphic design. They also express that these terms should be incorporated into the design for life. For example, a 23-year-old female graphic design student expressed, “The workshop has been an eye-opener in regard to the smallest of choices can make a big difference, such as the choice of colour, resolution, and the time taken to produce a design can make a big difference. These are lessons for a lifetime, and as a graphic design student who feels very passionately towards the cause of the environment, I am motivated to make good use of this new-found knowledge in practice.”

The graphic designer now understands the role and contribution of graphic design to carbon emission, so they now feel that every designer is not practicing to control or reduce the emission because they are not even aware of it. For example, a 20-year-old female graphic design student from Maharashtra mentioned that

"Quite frankly, it is alarming and is something that I feel needs to be talked about more. Educating fellow people in the field and others too will raise awareness and make us take steps towards a more sustainable approach while designing and providing solutions." These responses bring out the level of awareness among the graphic designers and graphic design students and the importance of awaking every designer for a positive impact on the environment.

4.2. RESPONSIBLE FACTOR IN GRAPHIC DESIGN FOR CARBON FOOTPRINT

Without accurate information, the responsible factors in the advertising graphic design cannot be assessed, which affects the environment negatively. So, it was planned to bring out some essential points from the research that has been conducted previously. A total of 10 points were prepared, presented to the participants, and asked to express their opinion regarding those points. Their response has been organized as per their acceptance in Table 2 This clearly states how many graphic designers and students agree with the points given. The higher numbers of participants agree that the colour application is the most source of maximum energy consumption. Moreover, the maximum number of respondents agree that using illustrations or pictures and dimension & resolution is also the most significant factor in more carbon emission through digital or online transmitted advertising.

Table 2

Table 2 Responsible factors in graphic design for carbon footprint

Factors	N	%
Environmental message depiction	19	63.3
Textual content	13	43.3
Illustration or Pictures	21	70
Dimension & Resolution	21	70
Color application	23	76.7
Designer's awarness	20	66.7
Designer's dedication to motivate their client/ team members	14	46.7
Stating the whole truth about product or service in the Graphic design	13	43.3
Minimalizing the design elements	19	63.3
Emphasizing on those elements that have recall ability	15	50

After these points, the need for a designer's awareness was considered one of the most significant factors by the graphic designer and students. Advertising graphic designers found environmental message depiction and minimalizing the design elements as influential factors for carbon emission. From the designer's point of recall ability, the participants have a neutral opinion. Textual content, designers' dedication to motivating their client/ team members, and stating the whole truth about a product or service in the graphic design were the minor points in this context.

4.3. THE RECALL ELEMENT

However, respondents expressed a neutral opinion about recall ability in advertising graphic design. However, one of the main characteristics of an effective advertisement is that it can ensure immediate purchase. For that, it must be able to

remember the advertisement. Advertising is responsible for cognitive response, and the communication carried through it is directly related to the recall ability Pope et al. (2004) Therefore, it is a simple exercise to incorporate recall capability into the graphic design of the ad, and its relevance cannot be overlooked. The responses given by the respondents in this context have been declared neutral because half of the respondents agreed with its graphic design and half disagreed. According to a 21-year-old female graphic design student, one of the respondents disagreed, "No, the recall element may not reduce the frequency of advertising content because recalling the element uses double energy for doing the recall process."

Another 23-year-old graphic designer believes that having the recall capability in the graphic design of the ad will undoubtedly reduce this run frequency and the power consumption. It has been proved that the leading cause of digital carbon emissions is data transmission, which requires energy, mainly electricity. "Yes, the RECALL ability can reduce the frequency of advertising content transmission on the internet. As well as it will help to reduce the energy consumption." Now a simple way to reduce the number of digital carbon emissions could be to reduce the data transmission. In the context of broadcasting advertisements, there can be only one way to minimize data transmission, which is to have such capability that it does not need to be broadcast repeatedly. Recall ability is the main factor that can prevent a recurrence because the advertising goal is to influence consumers' purchase decisions. For which the advertisement is presented to them again and again. Recall ability can drive the purchase decision, so it will be an essential factor Till and Baack (2005) Ang et al. (2007) Baack et al. (2008) Sheinin et al. (2011)

5. CONCLUSION

Like other people, graphic designers are also sensitive about their role in preventing environmental degradation and want to contribute something to it. However, as a designer, they do not do anything intentionally; if the advertising campaign is in a social or environmental context, then the message and theme must have talked about preventing environmental degradation. Where the product is manifested, the environmental message and subject depiction are found to be secondary. It is a factual truth that the creation of advertisements will continue uninterruptedly. The product's manifestation will be the highest among them. In such a situation, it would be more appropriate to address the design construction process to environmental compatibility. For this purpose, ensuring the designer's environmental responsibility relative to the creation of graphic design is a relevant topic. Suggested measures to incorporate environmental responsibilities into the design process are presented in three main categories, (i) awareness, (ii) design measures, and (iii) recall.

1) Graphic designers do not know how much they can contribute to environmental improvements by changing design dimensions. Therefore, design schools, advertising agencies, and marketers should run graphic design awareness campaigns for their environmental responsibilities.
2) The identified responsibilities are: Reducing design elements (such as reducing graphics, bleed, and size) by applying colour and illustration/ pictures to graphics is an environmentally effective technique. However, fewer respondents have expressed that textual content has a significant role, but a graphic designer should have effective textual content with an environmental message.

3) Although there was a neutral response on the recall ability in the graphic design, research has indicated the reduction in the data transmission frequency can prevent carbon emission, so it should restrict the continuous occurrence of advertisements on digital platforms. It can be ensured by the recall ability in the graphic content effectively. So, this ability should be incorporated into the advertisements.

Since many ICT companies have already taken the adequate steps to reduce digital carbon emission as NetZero and Carbon Neutral so a graphic design constructed responsibly will help them for achieving the environmental goals.

CONFLICT OF INTERESTS

None.

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