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ROLE OF SOCIAL MEDIA CAMPAIGNS IN CREATING AWARENESS ABOUT CLIMATE ISSUES AMONG UNIVERSITY STUDENTS IN LAHORE

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Abstract
This research aims to investigate the role of social media campaigns in creating awareness about climate issues among university students in Lahore. This study will cover three main factors; individualistic participation in activities to reduce causes of climate change, general awareness of the gravity of climate issues in Lahore, and the power of persuasion of social media in promoting climate-friendly practices among university students. This will be done with the assistance of a survey designed for university students of Lahore, which will be comprised of private, provincial, and national social media campaigns that target environmental issues within the city. By exploring the potential of social media campaigns to create awareness about climate issues among university students in Lahore, this study aims to contribute to developing effective environmental communication strategies and promote environmental activism among young people in Pakistan.

INTRODUCTION

Lahore is the second largest city in Pakistan, with an estimated population of 14 million, is considered to be the heart of the country (Macrotrends, 2024). Lahore is known as the city of gardens, yet, it is also the number one city in the country with the worst Air Quality Index, ranging from 800 AQI to 130 AQI in just one week (IQAir, 2024). The city has been a victim of a variety of environmental challenges, other than air pollution, which includes; water pollution, waste management issues, industrialisation, food insecurity, and unpredictable climate.

These environmental issues have led to a lot of difficulties within the city, such as the health of the inhabitants of the city, quality of education at all levels, economic loss for traders, increased load on hospitals, decreasing the rate of tourism and hoteling due to the locks downs and the overall quality of life of the people of Lahore. Much like the general notion, the next generation has a heavy weight to carry on its shoulders, unfortunately, research and data indicate that online environmental awareness campaigns have fallen short in terms of affecting the overall population of university students in Lahore. Social media, with its widespread reach and influence, is supposed to offer a promising platform for creating awareness about climate issues and promoting environmental activism among university students. Still, there seems to be a form of invisible smog-like obstacle that many researchers and analysts have failed to understand.

The goal of this study is to explore the correlation of social media campaigns in

creating awareness about climate issues and the persuasion power these campaigns have over the university students of Lahore. This will be done by categorising collected data through an online survey per the following factors; individualistic participation in activities to reduce causes of climate change, general awareness of the gravity of climate issues in Lahore, and the power of persuasion of social media in promoting climate-friendly practices among university students. The survey is to be circulated across the city, discussing private, provincial, and national social media campaigns that focus on environmental issues within the city. This study seeks to explore the potentiality of the existing campaigns with effects, to be able to contribute to the development of effective environmental communication strategies that are better suited to the appeal, interest and betterment of the young people of Pakistan.

Objectives

- To actively participate in activities intended to reduce causes of climate change.
- To persuade students to take certain preventive measures to combat climate change.
- To educate the students about the intensity of the issues related to climate change.

Hypothesis

H1: Students who participate in social media campaigns have a better understanding of climate change issues, as social media campaigns persuade students to participate in activities to combat climate change actively

LITERATURE REVIEW

Lahore also faces serious environmental challenges, including having the highest Air Quality Index (AQI) in the nation, with readings between 800 AQI and 130 AQI occurring within a single week (IQAir, 2024). In addition to air pollution, the city struggles with various other environmental issues such as water pollution, waste management problems, industrialization, food insecurity, and unpredictable climate patterns. These environmental problems have created significant challenges for the city's residents, impacting their health, the quality of education across all levels, economic losses for businesses, an increased burden on hospitals, a decline in tourism and hospitality due to lockdowns, and the overall quality of life for the people of Lahore. Like previous generations, the youth of today bear a considerable burden, and unfortunately, research suggests that online environmental awareness campaigns have not been effective in reaching the broader university student population in Lahore.

The topic of climate change has been ever persistent but came into the public hemisphere in the 1980s when academic research took place on the topic. Although climate change receives more media light during major catastrophes, the portal of such events can shift the interpretation based on the representation of the event. This signifies the importance of media coverage and as Pakistan ranks number 7 as the most vulnerable nation to climate change, the role of media can not be disregarded (Hase et al., 2020). "Representation of Climate Change in Pakistani Social Media: A Content Analysis", published in 2024, investigates how often climate change awareness and coverage have been represented on Instagram, X, and Facebook in Pakistan. Climate change discusses tend to revolve around causes, extreme weather swings, impacts, and suggested solutions which probe at the event highlighted by the post (Shelah et al., 2024). A Facebook post in 2021 revealed that the rainfall in January was below the average level by 59% reflecting the climate degradation of the country. Several environmentally friendly initiatives have attempted to tackle the climate crisis on a micro scale, for example, the 10 Billion Tree tsunami is one that was thoroughly promoted through the use of social media and led to the idea of tree planting which evoked a sense of responsibility within individuals (Shelah et al., 2024).

'Climate anxiety' and 'eco-anxiety' are common words used in Western ideology (American Psychological Association, 2020). Social media has enabled a large digital space for people to interact and share information, which shows its vast reach and power as a tool of communication. "Young People's Engagement with Climate Change Issues through Digital Media- A Content Analysis' analyses how social behaviour has changed as social media becomes more normalised in life, and how people interacting with climate crisis engage with the topic online to spread awareness to people who

are unaware of such experiences due to their surroundings or age (McCarthy et al.,). Youth activism and action are swiftly spread on social media and microblogs where pictures of the call to action are shared and create visual documentation of the event (Boulianne et al., 2020). Such activists destroy the traditional barriers by contacting and tagging political leaders on social media and commanding them to take responsibility for their negligence. This challenges the power dynamics and depicts how social media helps in conflicts by destroying hierarchies and geographic distances. On the other hand, the older generation tends to not heed mind towards the warnings of climatic change, on both, electronic and digital media.

"OK Boomer: A Decade of Generational Differences in Feelings about Climate Change", 2022 elaborates on how climate change has become a serious issue for the younger generations and how each generation responds to the crisis distinctly and uniquely. Furthermore, it focuses on the 2019 meme "OK Boomer", where Millennials and iGeneration used the statement to showcase their frustration with the Boomer generation. Serious environmental events like wildfires and hurricanes lead to emotional trauma which angers the young generation, destabilising their mental health. Psychological effect can allow the motivation for environmental change and activism but this depends on how different people respond to such threats, in a fight or determination. iGens have suffered far more than the older generations as they were at least eight when Hurricane Katrinna hit America (Swim). They have been forced to be accustomed to the terrors of ecological collapse. Environmental issues are directly interwoven with children's degrading health, and younger children tend to be more sensitive towards changes in their environment. Their health development contrasts with the progression of adults; hence they must be observed in a hyper-specific way that tends to their needs. It is less tedious and feasible to study how the use of social media can change and study children's environmental health through the use of interactive posts (Larkin et al., 2024). "Identifying Children's Environmental Health Risks, needs, misconceptions, and opportunities for Research Translation Using Social Media" studies different social media platforms to analyse how often topics like children's health are debated, and how the masses interact with such topics, in an attempt to gain awareness. This proves to be difficult when most posts stating the keywords, "baby" are applied to adults, and only 26% of posts labelled as "baby" or "toddler" refer to and depict a child.

If not the boomers, there is a form of environmental scepticism, where even young adults tend to 'not believe' news on social media, purely because of the lack of credibility factors. This is heavily linked with the practices of clickbait, misinformation, and misleading information, often produced by influencers, news channels and certain political parties to create a conception of the masses and sometimes for the need to go viral. Social media is much more than a platform meant to entertain, it has replaced newspapers and become the contemporary platform for obtaining the latest news, and information. In "Misconceptions of climate change among Russian-speaking Instagram users" (2021), Daria Chekalskaia observes how media perpetuates miscommunication, and misinformation which lead to conspiracies regarding climate action, and change. The denial of the increasing climate crisis stems from the reaction of the institutional bodies through media that cultivates apprehension in the audience, Russian President Putin's dismissal of the topic is evidence of this (NTV, 2019). Climate change scepticism enables suspicion, panic, and worry regarding issues of climate in general, thereby ignoring the problem, and increasing the carbon footprint. The problem with social media is that due to its massive reach, it does not mean that scientifically proven, informative posts will receive more, or at least the same public attention as posts that spread falsity (Qiu et al., 2017). Social media users with mutual ideologies and beliefs tend to rely on their perceptions, and misconceptions of other users, which allows misinformation to be invented, disseminated, and developed into a twistedly true phenomenon. In "Strategic Science Communication on Environmental Issues", Mathew C. Nisbet analyses how perceptions of the audience regarding climate change evolve depending on the outreach. It is seen that there are three major ways one may obtain recent

environmental news, and be influenced by it. It may be through a 'dialogic system' where selective public members are called into consultations with environmental experts, politicians, or through 'informal learning' that entails communication contexts of science museums, and centres, and other animal-centric environments. The final source is far more strategic in terms of scientific communication as it includes observing the socio-political context in which the science communication occurs and understanding the features that affect public perceptions, and behaviour. Maintaining trust with the public and knowing how to break information depending on public attitude is greatly important in scientific communication. Furthermore, apart from building trust, deconstructing myths, and conspiracies is as significant as breaking news to the audience. Mentally uncomfortable may not be accepted as it does not align with personal beliefs, and this may cause what psychologists believe to be cognitive dissonance. These highlight the importance and difficulties in the communication of environmental and scientific information.

The need to use social media to spread awareness about climate change is vital, considering the current climatic conditions, an increase in pollution and overall environmental issues witnessed across Lahore. Air pollution has become an urgent public health crisis in many urban centres worldwide, and Lahore, Pakistan's second-largest city, is no exception. Rapid urbanisation, industrial activities, and vehicular emissions have led to alarming levels of ambient air pollution in Lahore (Malhi et al., 2023). The analysis benchmarks pollutant levels against both national and international standards, revealing consistent exceedances of permissible limits for particulate matter (PM10 and PM2.5), nitrogen dioxide (NO2), and sulfur dioxide (SO2). Thus, robust air quality monitoring systems in urban settings are urgently needed to manage and mitigate pollution levels effectively. In studying meteorological influences on air quality in Lahore, it was proven that weather patterns, including temperature fluctuations and wind speeds, significantly affect pollutant dispersion. The research highlights critical correlations between increased ambient temperatures and traffic pollution, demonstrating the need for a meteorological component in air quality monitoring strategies. This finding affirms the necessity of a multidimensional approach to assessing air pollution where environmental and climatic factors are considered. Pakistan experiences immense heat waves, famines, floods, landslides, and water body hurricanes which show the extent of environmental degradation, and the vulnerability of the land. The study "Fighting Climate Change: A Critical Analysis of Clean Green Pakistan Initiative of Pakistan Tehreek-e-Insaf (PTI)" (2023), discusses how different countries have dealt with their environmental crisis like India, and goes into extreme detail regarding the political party's initiatives, breaking them down into detail. The party of Tehreek e Insaf created numerous initiatives to cultivate a healthier atmosphere for Pakistan including the Clean and Green Pakistan Movement which focuses on five significant features. These features include plantation, liquid waste, and hygiene, total sanitation, safe water, and solid waste management. A sub-branch of this initiative is the 'Ten-Billion-Tree Tsunami Program'.

The rise of smog is an ever-present issue that has been terrorising the masses, though the use of social media is to bring awareness on how to tackle this environmental problem. Public engagement is a strong response to the environmental crisis as communication between the public and their interaction allows social change (Clarke et al., 2020). "The Role of Social Media Campaigns in Raising Awareness about Smog (Climate Change) and Encouraging Sustainable Behaviors" (2023) elaborates on how social media can be exploited to plan and initiate campaigns and movements regarding rescue and relief programs. 84% of respondents thought smog had negative consequences that affected their health while 13.3% believed that it did not affect the body or lungs (Siddiqui et al., 2023). A large percentage of the sampled population believed in the climate-related news they saw on social media which exhibits the impact and influence social media has on perception. Pakistani does not contribute to climate change though is most affected by it, ranking as the most polluted for the third time in a row.

Studies indicate that actions taken online or offline regarding environmental issues often ignore the biggest community that addresses them and brings out a new perspective, the Gen Z online community. "Environmental Sense of Gen Z in Online Communities: Exploring the Roles of Sharing Knowledge and Social Movement on Instagram", 2021, depicts how the future generation deals with the contemporary issue of climate change, and how they offer solutions to the causes. Hidayat focuses on how each generation interacts with the environment differently, and how their perspective on the same topic differs based on experience. Gen Z has a vibrant presence offline and online as they navigate through the world their lifestyle is based upon trends and new attitudes. Convergence culture by Jenkins revolves around four elements: economic, technological, social and cultural. This research discovers a new feature and labels it as the digital environment as the backdrop of the environment can not be removed from the youth's identity, and visually dependant lifestyle (Leaver et al.,). Their identity is affected by their surroundings, sociocultural trends, family, and friends but most vitally, trends created by the media. As depicted by their habitual use of social media, environmental concern is a significant topic they are aware of. The rise of social media has transformed life and science by providing a vast platform for social scientists to research, though it has also negated the innate hierarchies of communication by taking authority from traditional gatekeepers. "The Social Media Lide of Climate Change: Platforms, Publics and Future Imaginaries", understands that literature on social media and environmental change is niche or limited and intends to bridge the gaps. Researchers should believe in following qualitative studies, visual communication and social media platforms that are not restricted to X or its algorithm (Warren et al.,n.d).

Research indicates that while there has been a notable increase in climate change awareness campaigns online, these efforts have not sufficiently reached or resonated with all demographics, particularly among university students. The generational divide highlights how younger populations respond differently to climate crises, often driven by emotional responses to environmental degradation and a desire for active participation in solutions. The findings suggest that initiatives aimed at enhancing environmental awareness must be nuanced, taking into account the unique perspectives and behaviours of Gen Z and their interactions with technology and media. Furthermore, the literature underscores the need for strategic communication that builds trust, dismantles misinformation, and encourages informed public discourse around environmental issues. As social and cultural contexts evolve, harnessing the potential of social media for meaningful dialogue and action is paramount. Collectively, these insights call for a robust, multidimensional approach to addressing climate change, emphasizing the essential role of diverse voices and experiences in cultivating a more sustainable future for Lahore and beyond. The studies reviewed indicate a pressing need for continued research to explore innovative communication strategies and engagement models that effectively mobilize communities and foster resilience in the face of environmental challenges.

METHODOLOGY

Research methodology is a technique that will assist in thoroughly investigating the research and in gathering and properly analyzing the outcomes. The choice of method will cater to the requirements of the hypothesis and the ease of audience under research.

Quantitative (Survey)

For the following quantitative study, an online survey was used. This method helped collect information about the opinions, beliefs, perceptions, and experiences of a larger population of university students (male and female in Lahore). The answers were through online questionnaires, with close-ended questions and opinion-based questions.

Population

The Population of interest for the research was University students of Lahore, which includes both male and female students of the following age groups: twenty (20), twenty-one (21) to twenty-two (22) and twenty-three (23) to twenty-four (24).

Universe of Study

The universe of this study was Lahore, a population of 14 million. Lahore is considered to be the heart of the country (Macrotrends, 2024). Lahore is known as the city of gardens, yet, it is also the number one city in the country with the worst Air Quality Index, ranging from 800 AQI to 130 AQI in just one week (IQAir, 2024). Sampling Technique

Convenience sampling is used as the sampling technique for this study. According to Edgar and Manz (2017), convenience sampling is a form of non-probability sampling technique that focuses on data collection from population participants who are conveniently available to participate in the study. This is done due to its cost-effectiveness and to gain better data, considering the respondents will be representing a larger population of university students in Lahore.

Sampling Size:

The intended target audience for this study was university students of Lahore, this included, both genders. The estimated number of responses was approximately a hundred respondents (n=100)

Unit of Analysis:

Every single respondent participating in the survey.

Data Collection:

The data for this study was collected through a self-administered survey which included questions on the mental and physical health of the respondents, related to the exposure to a variety of environmental challenges, other than air pollution, which includes; water pollution, waste management issues, industrialization, food insecurity, and unpredictable climate. Maximum efforts of creating close-ended questions were catered to, to avoid any form of misinterpretation or inconclusive answers. It was shared through online media, such as; WhatsApp, and was present in the form of Google Forms. The questionnaire was pretested to ensure dependability and validity.

Findings and Interpretations

The analysis was conducted by using infographics and descriptive statistics such as percentages, means, and graphs to display the numerical data, with the use of statistical software, while a short summary of 'opinion-based answers was generalized and presented in the 'results' section of the research.

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Have you heard, read or seen an these campaigns on any social m platform? * How often do participate in activities aimed reducing climate change in y community?	100	100.0%	0	0.0%	100	100.0%

Have you heard, read or seen any of these campaigns on any social media platform? * How often do you participate in activities aimed at reducing climate change in your community? Crosstabulation

			How often do you participate in activities aimed at reducing climate change in your community?					
			Almost Always	Never	Occasionally	Often	Rarely	Total
Have you heard, read or seen any of these campaigns on any social media platform?	"Breathe Pakistan" by DawnMedia	Count	0	3	9	2	4	18
		Expected Count	.7	1.4	8.1	2.5	5.2	18.0
	"Breathe Pakistan" by DawnMedia;Pakistan Tree Plantation Campaign 2024 by Alkhidmat Foundation	Count	0	0	2	2	1	5
		Expected Count	.2	.4	2.3	.7	1.5	5.0
	"Breathe Pakistan" by DawnMedia;Pakistan Tree Plantation Campaign 2024 by Alkhidmat Foundation; Billion Tsunami Tree and Green Pakistan by Pakistani Tehreek-e-Insaaf Government	Count	0	0	1	0	1	2
		Expected Count	.1	.2	.9	.3	.6	2.0
	"Breathe Pakistan" by DawnMedia;Pakistan Tree Plantation Campaign 2024 by Alkhidmat Foundation; Sohnidharti Climateers by Australian based Pakistanis;Billion Tsunami Tree and Green Pakistan by Pakistani Tehreek-e-Insaaf Government	Count	1	0	1	0	0	2
		Expected Count	.1	.2	.9	.3	.6	2.0
	Billion Tsunami Tree and Green Pakistan by Pakistani Tehreek-e-Insaaf Government	Count	2	3	6	2	10	23
		Expected Count	.9	1.8	10.4	3.2	6.7	23.0
	Pakistan Tree Plantation Campaign 2024 by Alkhidmat Foundation	Count	1	1	17	1	11	31
		Expected Count	1.2	2.5	14.0	4.3	9.0	31.0
	Pakistan Tree Plantation Campaign 2024 by Alkhidmat Foundation; Billion Tsunami Tree and Green Pakistan by Pakistani Tehreek-e-Insaaf Government	Count	0	1	7	5	2	15
		Expected Count	.6	1.2	6.8	2.1	4.4	15.0
	Pakistan Tree Plantation Campaign 2024 by Alkhidmat Foundation; Sohnidharti Climateers by Australian based Pakistanis	Count	0	0	1	1	0	2
		Expected Count	.1	.2	.9	.3	.6	2.0
	Pakistan Tree Plantation Campaign 2024 by Alkhidmat Foundation; Sohnidharti Climateers by Australian based Pakistanis;Billion Tsunami Tree and Green Pakistan by Pakistani Tehreek-e-Insaaf Government	Count	0	0	1	0	0	1
		Expected Count	.0	.1	.5	.1	.3	1.0
	Sohnidharti Climateers by Australian based Pakistanis;Billion Tsunami Tree and Green Pakistan by Pakistani Tehreek-e-Insaaf Government	Count	0	0	0	1	0	1
		Expected Count	.0	.1	.5	.1	.3	1.0
Total		Count	4	8	45	14	29	100
		Expected Count	4.0	8.0	45.0	14.0	29.0	100.0

Double-click to activate

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sid
Pearson Chi-Square	45.063[a]	36	.143
Likelihood Ratio	38.461	36	.359
N of Valid Cases	100		

a. 43 cells (86.0%) have expected count less than 5. The minimum expected count is .04.

INTERPRETATION:

The Chi-Square test results indicate that there is **no statistically significant association** between the two variables tested, as the **p-value (Asymptotic Significance)** is **0.143**, which is greater than the conventional significance level of **0.05**. Therefore, we **fail to reject the null hypothesis**, suggesting that any observed differences between groups are likely due to chance. Additionally, it's important to note that the test's reliability may be compromised, as **86% of the cells have expected counts less than 5**, violating a key assumption of the Chi-Square test. This indicates that the sample size may be too small or the data too sparse for a valid conclusion, and collapsing categories or using an alternative test (like Fisher's Exact xTest) may be advisable.

Discussion and Analysis

The purpose of this study was to determine the effect of exposure to environment-targeted social media campaigns among university students in Lahore, focusing on their understanding of climate change and their self-reported participation in eco-friendly behaviours. The crux of the findings highlighted that exposure, which was operationalised in the study, was not, or could not, be associated with either, or both, cognitive framing or behavioural frequency, symbolising that superficial contact with the online campaign contents accounted for more of a wallpaper effect rather than providing sufficient proof that alters mental models or everyday practices. Nonetheless, this supports the pre-existing theories and prior empirical work on the awareness-action gap, suggesting that information alone is not enough to drive change. Information exposure does increase issue salience, but at a peripheral level, disregarding the central routes that usually lead to deeper understanding or lasting behavioural change, unless the messages also increase the perceived response efficacy, provide proper guidance, and resonate with the audience through relatable messengers.

Students' cognitive models of climatic issues seem to be resistant to change through passive exposure. There is a need for deeper elaboration, dialogic engagement or at least corrective framing that explicitly emphasises and consolidates systematic explanations along with individual responsibility. Furthermore, campaigns that do not address the following factors of social and personal behaviours tended to have limited downstream impact: perceived convenience, expected benefits, social norms and structural constraints. Addressing these facilitators and barriers is a must for the current and upcoming digitally driven generations. Therefore, with respect to the research question, the data indicate that exposure is insufficient to explain the variation in either cognitive processing or self-reported actions among the sampled students, which leads to the need for dynamic campaign designs that move beyond generic reach metrics and mundane scripts.

A closer examination of the null results reveals both substantive insights and methodological limitations. The coarse measurement of exposure likely masked potential effects, as it didn't distinguish between different levels of engagement, such as passively scrolling through content versus actively sharing it. This lack of nuance may have reduced the sensitivity to detect dose-response relationships or depth of processing. Measurement limitations tend to have attenuated observable effects due to the exposure variable's broad categorisation, which merged diverse experiences (e.g., passive viewing vs. active engagement). This reduced sensitivity to processing depth. Furthermore, the outcome variables' complex structure led to sparse data, compromising the statistical power of the contingency tests, limiting the ability to detect relevant associations.

Contextual factors unique to Lahore may have influenced the results, with local environmental concerns, institutional trust, and cultural norms around civic engagement potentially moderating campaign effectiveness. Generic social media messages may be insufficient to alter causal attributions or habitual behavior in this context. Moreover, message content and framing are crucial: campaigns focusing solely on individual responsibility without acknowledging systemic factors may reinforce fragmented or polarized causal understandings. Messages lacking clear, actionable steps or social reinforcement may also fail to bridge the intention-behavior gap, underscoring the need for context-sensitive and strategically framed campaign designs. The study's findings suggest that algorithmic and social network factors can compromise

campaign content, potentially leading to overestimation of impact when exposure metrics overlook platform dynamics. Future studies would benefit from more nuanced exposure measures, multi-item scales for assessing understanding and behaviour, larger and more diverse samples, and analytical approaches tailored to ordinal outcomes. From a practical standpoint, the analysis highlights the importance of pairing visibility efforts with targeted, efficacy-focused messaging, leveraging trusted local messengers, and providing structural supports like commitment devices and streamlined action options to translate awareness into sustained behavioural change within society.

Conclusion

Finally concluding, this study's null findings offer valuable insights, challenging the assumption that reach automatically translates to impact. Instead, they highlight the need for more refined approaches that target the cognitive and structural drivers of climate-related behaviour. By demonstrating that exposure alone is insufficient to predict understanding or action, the study emphasises the importance of shifting from superficial reach metrics to strategies that foster deeper audience engagement and facilitate meaningful behavioural change.

Ethical Considerations:

This research followed all forms of ethical standards, including; informed consent, the privacy of data, ensuring anonymity, and preventing any form of triggering or offensive questions.

Limitations:

Considering that the study is limited to youngsters who tend to avoid being honest and filling surveys for it is often time-consuming, the findings may be generalizing a larger population. In addition to this, cultural norms such as a 'desensitized' attitude towards mental health, physical health and environmental issues may act as a limiting factor and barrier towards honest answers.

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