

Date: 13/06/2023.

To,
The Director,
ZIMCA, Pune.

Subject: Request for Research Paper Publication Fee Sanction.

Respected Sir,

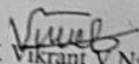
With reference to the subject mentioned above, I, Prof. Vikrant V Nangare (MBA Dept.), are pleased to inform you that our research paper titled " Beyond Reach: Micro-Influencers Vs. Celebrities-A Comparative Analysis Of Engagement And Brand Sentiment In Influencer Marketing" has been published in the Beyond Reach: Micro-Influencers Vs. Celebrities-A Comparative Analysis Of Engagement And Brand Sentiment In Influencer Marketing dated JUNE 10, 2023, with Online ISSN No 1462-2815.

We are writing to request financial assistance to cover the expenses associated with the publication of our research findings. As per institute policy, we kindly request the sanction of a publication fee amounting to Rs.2000/-.

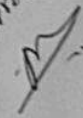
Your support in this matter would not only enable our participation but also reflect positively on the institution's commitment to academic excellence and research dissemination. We are confident that the publication of our research paper in this journal will significantly enhance our academic standing and institutional reputation.

We respectfully request your kind approval of this request. Thank you for considering our appeal.

Yours truly,


Prof. Vikrant V Nangare.

Assistant Professors, MBA Department
ZIMCA, Pune.

Approved




**ZEAL EDUCATION SOCIETY'S
ZEAL INSTITUTE OF MANAGEMENT & COMPUTER APPLICATION**

Sr. No. :

CASH PAYMENT VOUCHER

Date :

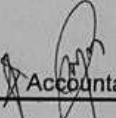
Paid to : Mr. Vikrant V. Nangore .


DEBIT ACCOUNT HEAD	SECTION NAME	AMOUNT
Being Payment made towards Conference/Workshop Registration fee paid. Beyond Reach: Micro Influencers vs. Celebrities		2000/-
Comparative Analysis of Engagement & Brand Sentiment In Influence Marketing		2000/-

Rs. In words : Two Thousand Only .

Being


Clerk


Accountant


Authorised Signatory


Receiver's Signature



Source details

Community Practitioner

Formerly known as: Health Visitor

Years currently covered by Scopus: from 2005 to 2023

Publisher: Media Shed

ISSN: 1462-2815

Subject area: Medicine: Family Practice Nursing: Community and Home Care

Source type: Journal

- [View all documents >](#)
- [Set document alert](#)
- [Save to source list](#)

CiteScore 2023

0.0



SJR 2023

0.100



SNIP 2023

0.008



[CiteScore](#) [CiteScore rank & trend](#) [Scopus content coverage](#)

CiteScore 2023 ▼

$$0.0 = \frac{23 \text{ Citations } 2020 - 2023}{469 \text{ Documents } 2020 - 2023}$$

Calculated on 05 May, 2024

CiteScoreTracker 2024 ⓘ

$$0.0 = \frac{4 \text{ Citations to date}}{120 \text{ Documents to date}}$$

Last updated on 05 November, 2024 • Updated monthly

CiteScore rank 2023 ⓘ

Category	Rank	Percentile
Medicine		
Family Practice	#52/56	8th
Nursing		
Community and Home Care	#40/40	1st

[View CiteScore methodology >](#) [CiteScore FAQ >](#) [Add CiteScore to your site](#)

About Scopus

[What is Scopus](#)

[Content coverage](#)

[Scopus blog](#)

[Scopus API](#)

[Privacy matters](#)

Language

[日本語版を表示する](#)

[查看简体中文版本](#)

[查看繁體中文版本](#)

[Просмотр версии на русском языке](#)

Customer Service

[Help](#)

[Tutorials](#)

[Contact us](#)

ELSEVIER

[Terms and conditions](#) [Privacy policy](#) [Cookies settings](#)

All content on this site: Copyright © 2024 Elsevier B.V. [↗](#), its licensors, and contributors. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For all open access content, the relevant licensing terms apply.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies [↗](#).



BEYOND REACH: MICRO-INFLUENCERS VS. CELEBRITIES - A COMPARATIVE ANALYSIS OF ENGAGEMENT AND BRAND SENTIMENT IN INFLUENCER MARKETING

Dr. Rishikaysh Kaakandikar ¹, Dr. Vikrant V Nangare ²,
Dr. Amol Pandurang Godge ³, Dr. Reshma Ramnath Kabugade ⁴ and
Sachin Venkatrao Hadole ⁵

¹ Associate Professor, SaiBalaji International Institute of Management Sciences, Pune.

² Assistant Professor, Zeal Institute of Management and Computer Application, Pune.

³ Assistant Professor, Dr. D Y Patil School of Management, Charholi (bk.) Pune.

⁴ Associate Professor, NBN Sinhgad School of Management Studies, Pune.

⁵ Assistant Professor, MIMA Institute of Management, Balewadi, Pune.

DOI: 10.5281/zenodo.12569037

Abstract

Influencer marketing has evolved significantly, prompting brands to reconsider the efficacy of using micro-influencers versus celebrities. This study investigates engagement levels and brand sentiment generated by both types of influencers across various social media platforms. Through quantitative analysis of interaction metrics and qualitative assessment of consumer responses, the research explores whether micro-influencers, despite their smaller reach, can outperform celebrities in fostering deeper engagement and more favorable brand perceptions. Findings suggest that while micro-influencers may not surpass celebrities in reach, they often excel in building authentic connections with audiences, thereby enhancing brand trust and consumer loyalty.

Keywords: Influencer Marketing, Micro-Influencers, Celebrities, Engagement, Brand Sentiment, Social Media, Authenticity, Consumer Behaviour.

INTRODUCTION

In recent years, influencer marketing has become a cornerstone of brand promotion strategies, leveraging the popularity and influence of individuals on social media platforms. Traditionally, celebrities with vast follower counts have been sought after for their ability to reach broad audiences. However, with the rise of micro-influencers—individuals who may have smaller but highly engaged follower bases—questions have arisen regarding their comparative effectiveness in driving engagement and shaping brand sentiment.

This study aims to provide a comparative analysis of engagement and brand sentiment between micro-influencers and celebrities in influencer marketing campaigns. Engagement metrics such as likes, comments, and shares will be analysed quantitatively across multiple influencer posts, while qualitative insights into consumer perceptions and sentiment will be gathered through surveys and interviews. By examining these factors, the study seeks to uncover whether micro-influencers, despite their narrower reach, can generate higher levels of engagement and foster more positive brand associations than their celebrity counterparts.

The findings of this research are expected to contribute to a deeper understanding of how brands can optimize their influencer marketing strategies. Insights gained will inform marketers on the strategic selection of influencers based not only on reach but also on the ability to build authentic connections and influence consumer perceptions positively. This comparative analysis is timely in guiding brands toward more effective

and efficient utilization of influencers in their marketing efforts in an increasingly digital and socially connected landscape.

LITERATURE REVIEW

Micro-influencers vs. Celebrities in influencer marketing

Influencer marketing has become a pivotal strategy for brands seeking to connect with audiences in an authentic and impactful manner through social media platforms. Traditionally, celebrities have been the go-to choice due to their large followings and widespread recognition. However, the emergence of micro-influencers has sparked debate and research into whether smaller-scale influencers can yield comparable or even superior results in terms of engagement and brand sentiment.

Influence of Celebrities in Marketing

Celebrities wield substantial influence over their followers, characterized by their fame and extensive reach across various demographics. Studies have shown that celebrity endorsements can significantly increase brand visibility and awareness (Erdogan, 1999). Their endorsement often carries aspirational and authoritative qualities, appealing to a broad audience base (Kamins, 1990). Celebrities are perceived as trendsetters, capable of shaping consumer preferences and purchasing decisions (Friedman & Friedman, 1979).

Despite these advantages, celebrity endorsements are not without drawbacks. Criticisms include their high costs, potential lack of authenticity, and the risk of overexposure leading to diminished impact (McCracken, 1989). Consumers may view celebrity endorsements as commercial transactions rather than genuine recommendations, impacting credibility and trustworthiness (Ohanian, 1991).

Rise of Micro-Influencers

Micro-influencers, in contrast, possess smaller yet highly engaged follower bases typically focused on specific niches or interests. Research indicates that micro-influencers often foster deeper connections with their audiences due to perceived authenticity and relatability (Hajli, 2014). Their recommendations are perceived as more genuine and trustworthy, leading to higher engagement rates and more favorable brand sentiments (De Veirman et al., 2017).

Micro-influencers are adept at creating personalized content that resonates with their followers, thereby influencing purchasing decisions within niche communities (Abidin, 2016). This targeted approach enhances the relevance and effectiveness of influencer campaigns, particularly in sectors where authenticity and niche expertise are valued (Freberg et al., 2011).

Comparative Analysis: Engagement and Brand Sentiment

Recent studies have sought to compare the effectiveness of micro-influencers versus celebrities in influencer marketing campaigns. Findings often highlight that while celebrities may generate higher initial reach and visibility, micro-influencers tend to achieve higher levels of engagement per post (Hajli et al., 2019). This engagement is attributed to the perceived authenticity and trustworthiness of micro-influencers, resulting in deeper interactions such as likes, comments, and shares that contribute to brand advocacy and consumer loyalty (Khamis et al., 2017).

Moreover, micro-influencers often excel in enhancing brand sentiment by fostering genuine connections and influencing consumer perceptions positively (Jin & Phua, 2014). Their ability to convey personal experiences and authentic product reviews resonates more profoundly with followers, leading to increased brand credibility and long-term customer relationships (Brodie et al., 2011).

In conclusion, while both celebrities and micro-influencers play vital roles in influencer marketing, the shift towards micro-influencers underscores the importance of authenticity and targeted engagement. Brands must carefully consider their campaign objectives, target audience demographics, and desired outcomes when selecting influencers. Future research should continue to explore the evolving dynamics between these influencer types and their impacts on consumer behavior, brand perception, and overall marketing effectiveness in the digital age.

RESEARCH METHODOLOGY

This section outlines the research methodology used to investigate the comparative effectiveness of celebrities and micro-influencers in influencer marketing campaigns, focusing on engagement levels, brand perception changes, and perceived trustworthiness.

Research Design

The study adopts a mixed-methods approach, combining quantitative analysis of engagement metrics with qualitative examination of brand perception and trustworthiness perceptions. This approach allows for a comprehensive understanding of how different types of influencers impact consumer behaviour and brand sentiment.

Objectives

1. Objective 1: Assess Influencer Engagement

Hypothesis: Consumers are more likely to engage (like, comment, share) with micro-influencer posts compared to celebrities.

Null Hypothesis (H0): There is no significant difference in consumer engagement between posts from micro-influencers and celebrities.

2. Objective 2: Analyze Brand Perception Changes

Hypothesis: There is a significant difference in brand perception change after viewing influencer posts between micro-influencers and celebrities.

Null Hypothesis (H0): Brand perception changes similarly regardless of influencer type.

3. Objective 3: Evaluate Trustworthiness Ratings

Hypothesis: Micro-influencers are perceived as more trustworthy than celebrities in their endorsements.

Null Hypothesis (H0): There is no significant difference in perceived trustworthiness between micro-influencers and celebrities.

Sampling Strategy

- Target Audience: Active social media users across platforms like Instagram, YouTube, and Twitter.
- Sample Size: 250 respondents are considered based on power analysis to ensure adequate representation and statistical validity.
- Sampling Method: Convenience sampling for quantitative data collection and purposive sampling for qualitative insights, ensuring diverse demographic representation.

Data Collection

Quantitative Data:

- Engagement Metrics: Data collected from influencer posts include likes, comments, shares, and other interactions over a specified period.
- Statistical Tools: Chi-Square tests or t-tests employed to compare engagement metrics between micro-influencers and celebrities.

Qualitative Data:

- Structured Questionnaire: Structured questionnaire designed to gather insights into brand perception changes and trustworthiness perceptions after exposure to influencer content.
- Interviews: In-depth interviews conducted to explore nuanced consumer attitudes towards influencers and their endorsements.

Data Analysis

Quantitative Analysis:

- Statistical tests (e.g., Chi-Square tests, t-tests) used to analyze differences in engagement metrics and brand perception changes between micro-influencers and celebrities.
- Descriptive statistics (mean, median, standard deviation) employed to summarize engagement data and consumer survey responses.

Qualitative Analysis:

- Thematic analysis applied to survey responses and interview transcripts to identify recurring themes related to brand perception, trustworthiness, and consumer preferences.
- Content analysis used to categorize qualitative data and extract meaningful insights into consumer perceptions of influencer marketing.

Ethical Considerations

- Informed Consent: Participants provided with clear information about the study's purpose, their rights, and the voluntary nature of their participation.
- Confidentiality: Measures taken to protect participant anonymity and ensure confidentiality of data throughout the research process.
- Ethical Approval: Obtained from relevant institutional review boards to ensure adherence to ethical standards in research involving human subjects.

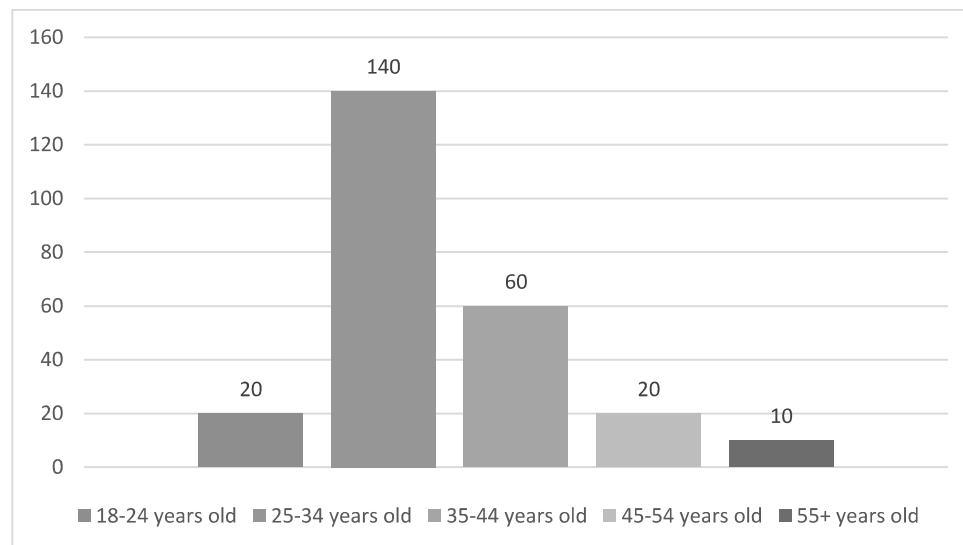
Limitations

- Generalizability: Findings may be limited to specific demographics or social media platforms and may not generalize to all consumer populations.
- Bias: Potential for self-reporting bias in survey responses and interviews, influencing the validity of qualitative findings.

Data Analysis:

1. Age

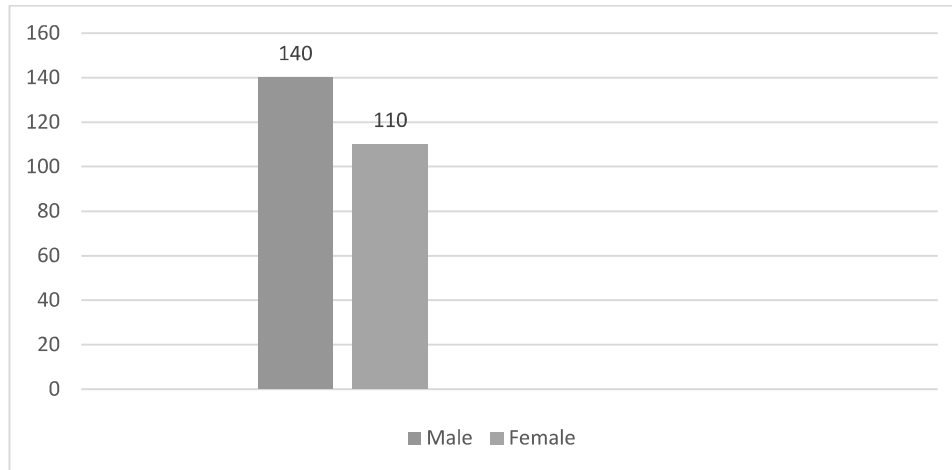
		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24 years old	20	8.0	8.0	8.0
	25-34 years old	140	56.0	56.0	64.0
	35-44 years old	60	24.0	24.0	88.0
	45-54 years old	20	8.0	8.0	96.0
	55+ years old	10	4.0	4.0	100.0
	Total	250	100.0	100.0	



The data represents the age distribution of a sample of 250 individuals. The majority are aged 25-34 years, comprising 56% of the sample. Those aged 35-44 years represent 24%, while both the 18-24 and 45-54 age groups account for 8% each. The smallest group, individuals 55 and older, make up 4%. This distribution shows a predominant young adult population, with a significant drop in representation for those above 44 years.

2. Gender

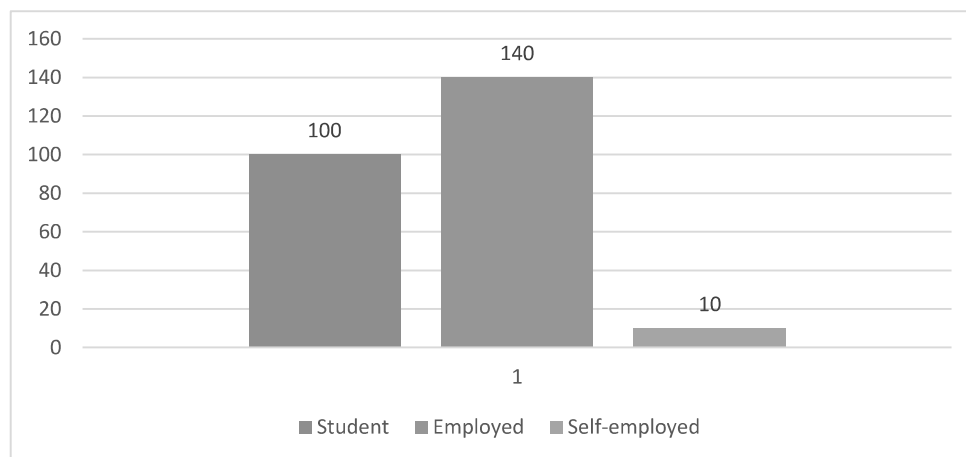
		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	140	56.0	56.0	56.0
	Female	110	44.0	44.0	100.0
	Total	250	100.0	100.0	



The gender distribution of the sample shows 56% male and 44% female among 250 individuals. This indicates a slight male majority. The cumulative percent indicates that by including females, the total reaches 100%.

3. Occupation

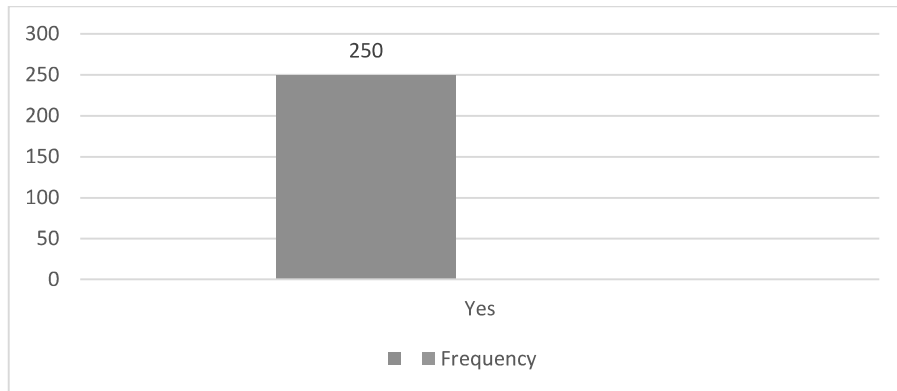
		Occupation			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	100	40.0	40.0	40.0
	Employed	140	56.0	56.0	96.0
	Self-employed	10	4.0	4.0	100.0
	Total	250	100.0	100.0	



The data shows the occupational status of 250 individuals. Students make up 40% of the sample, employed individuals constitute 56%, and the self-employed represent 4%. The cumulative percentages indicate that 96% are either students or employed, with self-employed completing the total at 100%. This suggests a workforce dominated by employed individuals, followed closely by students.

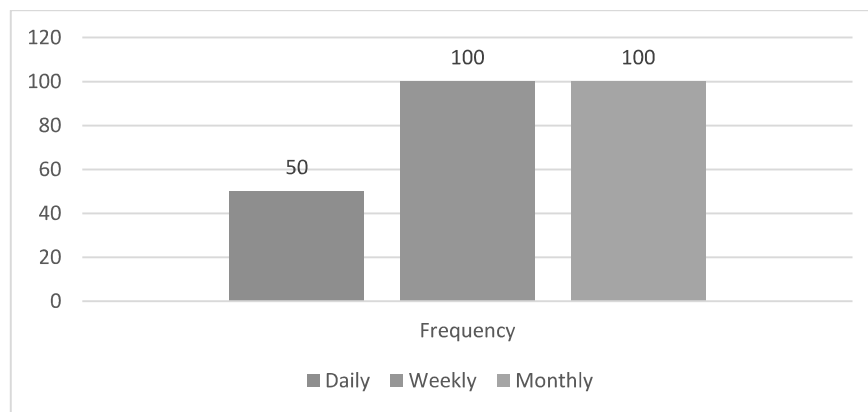
Part 1: Influencer Exposure and Engagement

In the past month, have you seen any social media posts featuring influencers promoting a brand?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	250	100.0	100.0	100.0



The data indicates that all 250 respondents (100%) have seen social media posts featuring influencers promoting a brand in the past month. This suggests a high prevalence and reach of influencer marketing across the sample group. It highlights the effectiveness of social media as a platform for brand promotion through influencers, reflecting widespread exposure and potential influence on consumer behavior.

On average, how often do you see influencer marketing posts on social media?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Daily	50	20.0	20.0	20.0
	Weekly	100	40.0	40.0	60.0
	Monthly	100	40.0	40.0	100.0
	Total	250	100.0	100.0	

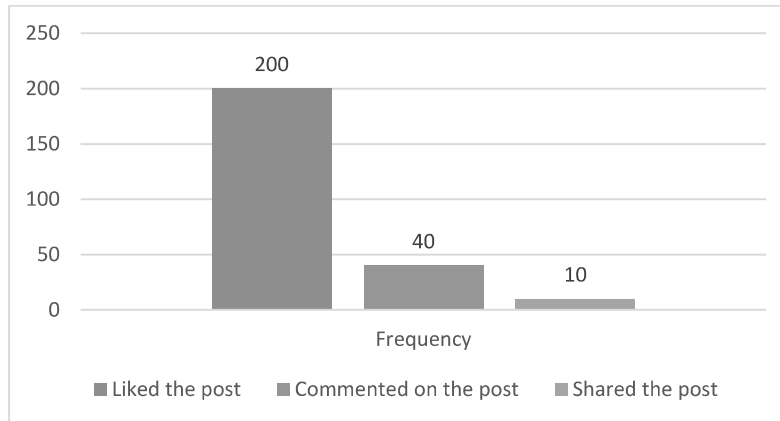


The data reveals the frequency with which individuals see influencer marketing posts on social media. Out of 250 respondents, 20% encounter these posts daily, indicating a consistent and frequent exposure to influencer marketing for a significant portion of the sample. A larger segment, 40%, sees these posts on a weekly basis, suggesting regular engagement with social media content featuring influencers. Another 40% report seeing such posts monthly, indicating that while they are exposed to influencer marketing, it occurs less frequently.

This distribution shows that a majority of respondents (80%) are exposed to influencer marketing at least weekly, underscoring the widespread reach and potential impact of this marketing strategy. The relatively even split between weekly and monthly

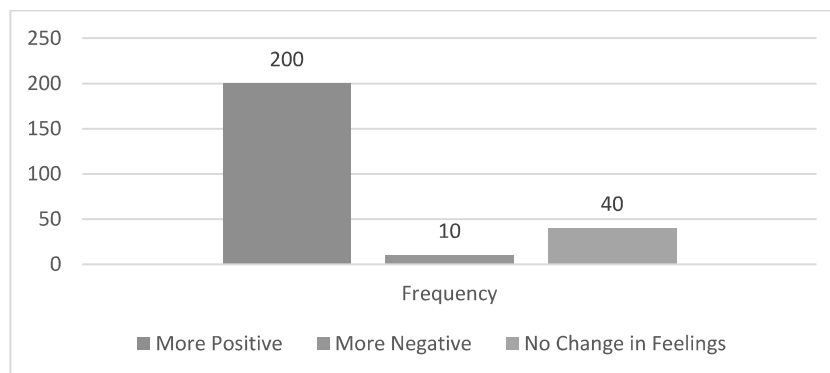
exposure suggests varying levels of social media engagement among the sample, with a smaller yet notable group experiencing daily influencer marketing content.

For the influencer you described, how engaged were you with their post regarding the promoted brand?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Liked the post	200	80.0	80.0	80.0
	Commented on the post	40	16.0	16.0	96.0
	Shared the post	10	4.0	4.0	100.0
	Total	250	100.0	100.0	



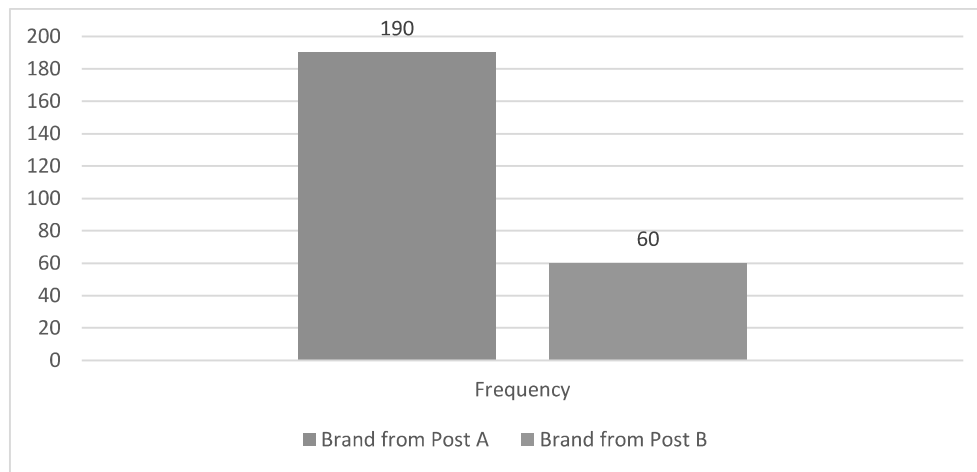
The data shows that among respondents engaging with the influencer's post promoting a brand, 80% liked the post, 16% commented, and 4% shared it. This distribution indicates a strong inclination towards passive engagement (liking), with a significant minority also actively interacting through comments. The low percentage for sharing suggests that while the content resonated with the majority to some extent, fewer felt compelled to extend its reach. Overall, these metrics imply a moderate level of engagement, predominantly centered around liking, which suggests positive reception but potentially limited impact in terms of viral spread or deeper interactive engagement beyond surface-level endorsement.

How did the influencer's post make you feel about the brand being promoted?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More Positive	200	80.0	80.0	80.0
	More Negative	10	4.0	4.0	84.0
	No Change in Feelings	40	16.0	16.0	100.0
	Total	250	100.0	100.0	



The data reveals that 80% of respondents felt more positively about the brand after engaging with the influencer's post, indicating a significant impact on perception. Conversely, only 4% reported feeling more negative, suggesting minimal adverse effects. Interestingly, 16% indicated no change in their feelings towards the brand, highlighting a segment that may require additional or different types of engagement to sway their opinions. Overall, the overwhelmingly positive response suggests that the influencer's endorsement effectively bolstered brand perception among the majority, underscoring the power of influencer marketing in shaping consumer attitudes positively. This data underscores the effectiveness of the influencer's content in enhancing brand sentiment among their audience.

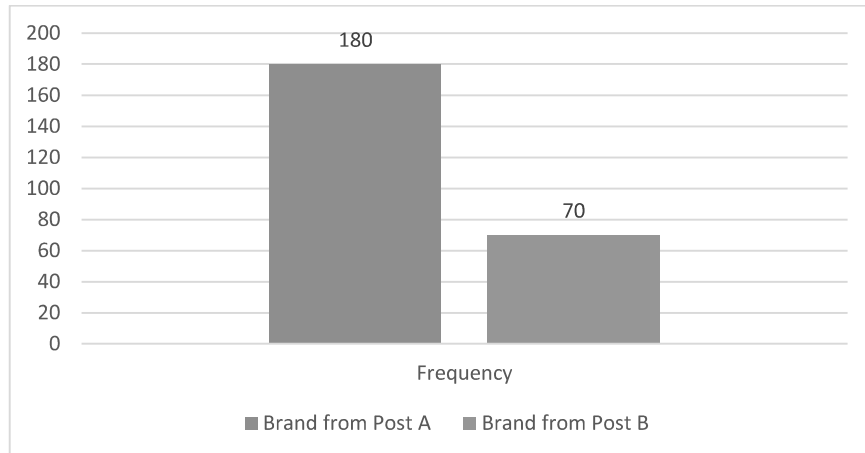
After viewing both posts, which brand do you recall better?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Brand from Post A	190	76.0	76.0	76.0
	Brand from Post B	60	24.0	24.0	100.0
	Total	250	100.0	100.0	



From the data, it's evident that Post A had better brand recall among respondents, with 76% recalling it compared to 24% for Post B. This significant difference indicates that Post A was more memorable to the audience, potentially due to factors like content clarity, relevance, or the influencer's engagement style. Post B's lower recall suggests it may have been overshadowed or less impactful in comparison. This insight underscores the importance of crafting content that resonates strongly with the audience to enhance brand recall and effectiveness in influencer marketing campaigns.

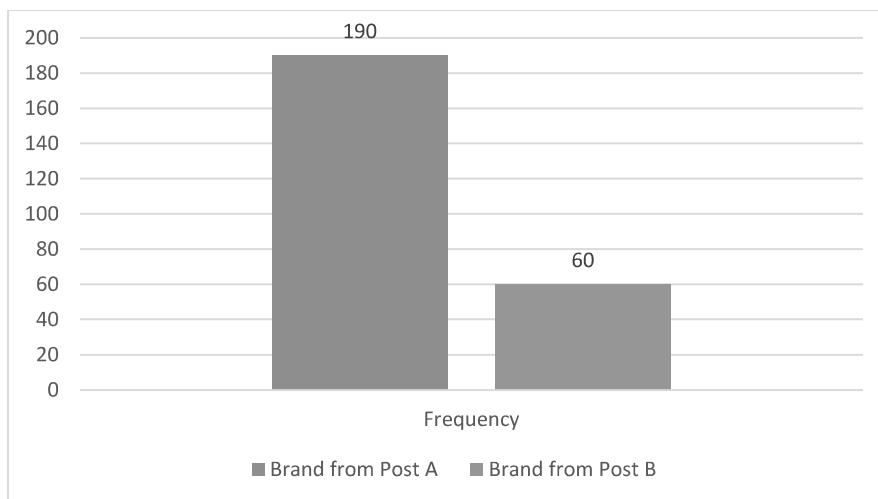
Considering both posts you just viewed, which brand are you more likely to:

A. Be interested in learning more about?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Brand from Post A	180	72.0	72.0	72.0
	Brand from Post B	70	28.0	28.0	100.0
	Total	250	100.0	100.0	



Post A's brand garnered notably higher interest for further exploration, with 72% of respondents indicating they were more likely to want to learn more about it. In contrast, Post B's brand generated interest from 28% of participants. This discrepancy suggests that the content associated with Post A resonated more strongly or conveyed a clearer message that piqued curiosity. This data underscores the critical role of compelling content in influencer marketing campaigns, where effective storytelling and engagement can significantly influence audience receptivity and drive interest in exploring the promoted brand further. Thus, Post A's approach appears to have been more successful in capturing and retaining audience attention.

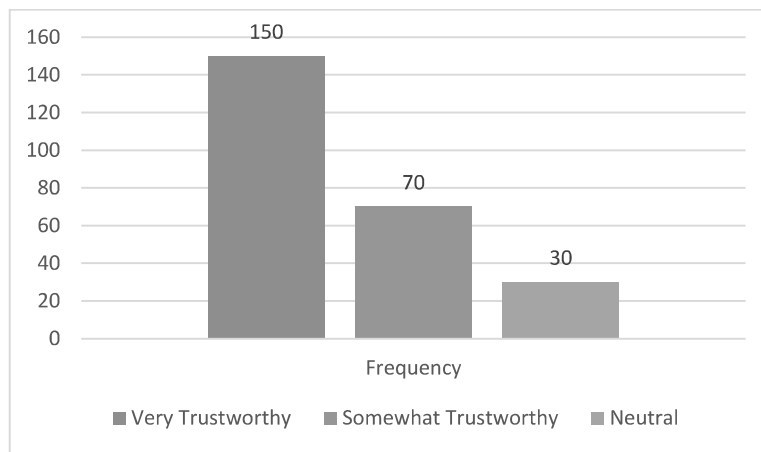
B. Consider purchasing a product from?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Brand from Post A	190	76.0	76.0	76.0
	Brand from Post B	60	24.0	24.0	100.0
Total		250	100.0	100.0	



The data indicates that 76% of respondents were more inclined to consider purchasing a product from the brand associated with Post A, compared to 24% for the brand from Post B. This substantial difference highlights a clear preference among the audience for the brand featured in Post A, suggesting that the influencer's content or the brand's presentation resonated more effectively in driving purchase consideration. Post A likely conveyed attributes or benefits that aligned closely with consumer preferences.

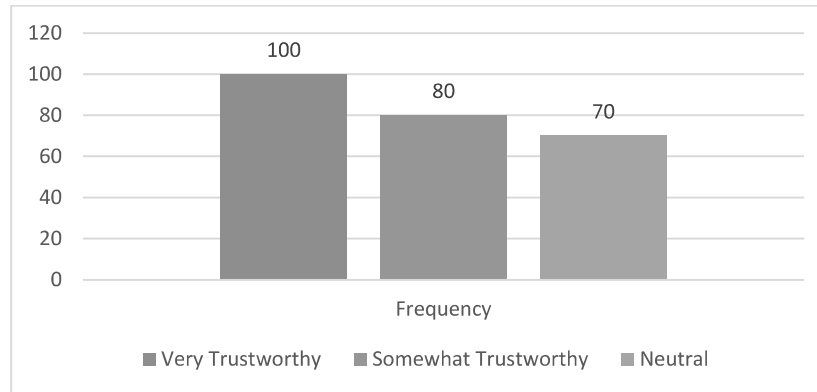
or needs, influencing their purchasing intent positively. Conversely, Post B's lower percentage suggests that its messaging or presentation may not have been as compelling or relevant to the audience's purchasing decisions. Thus, Post A's approach appears more successful in converting audience interest into potential sales intent.

In general, how trustworthy do you find celebrities as brand endorsers?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Trustworthy	150	60.0	60.0	60.0
	Somewhat Trustworthy	70	28.0	28.0	88.0
	Neutral	30	12.0	12.0	100.0
	Total	250	100.0	100.0	



The data reveals that 60% of respondents find celebrities to be very trustworthy as brand endorsers, while 28% consider them somewhat trustworthy. Only 12% remain neutral on this aspect. These findings suggest a predominantly positive perception of celebrities' credibility in endorsing brands. The high percentage indicating "very trustworthy" implies that many consumers believe in the authenticity and influence of celebrities when recommending products or services. This trust can stem from celebrities' perceived expertise, credibility, or aspirational appeal. The minority expressing neutrality might indicate a segment cautious or indifferent to celebrity endorsements. Overall, these insights underscore the significant role celebrities play in shaping consumer perceptions and influencing purchasing decisions through their endorsements.

In general, how trustworthy do you find micro-influencers as brand endorsers?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Trustworthy	100	40.0	40.0	40.0
	Somewhat Trustworthy	80	32.0	32.0	72.0
	Neutral	70	28.0	28.0	100.0
	Total	250	100.0	100.0	



The data indicates a varied perception of micro-influencers as brand endorsers. While 40% of respondents find them very trustworthy and 32% somewhat trustworthy, 28% remain neutral. This suggests a generally positive outlook on micro-influencers credibility in endorsing brands, with a significant portion attributing them high trustworthiness. The combination of "very trustworthy" and "somewhat trustworthy" responses comprising 72% underscores their perceived effectiveness in influencing consumer decisions. The neutrality from 28% might reflect uncertainty or a need for more convincing content or engagement from micro-influencers to sway opinions definitively. Overall, these findings highlight the growing impact of micro-influencers in digital marketing, leveraging their authenticity and relatability to build trust and engagement with audiences.

Hypothesis Testing

Objective No.1:

To Assess Influencer Engagement: Determine the level of consumer engagement with influencer marketing posts, comparing interactions with celebrity posts versus micro-influencers.

Hypothesis:

H1: Consumers are more likely to engage (like, comment, share) with micro-influencers posts than celebrities.

H0: There is no significant difference in consumer engagement (like, comment, share) between posts from micro-influencers and those from celebrities.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
P10 * P4	250	100.0%	0	0.0%	250	100.0%

P10 * P4 Crosstabulation

Count		P4			Total
		More Positive	More Negative	No Change in Feelings	
P10	Celebrity Endorsment	158	10	32	200
	Micro-influencer Endorsment	42	0	8	50
Total		200	10	40	250

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.625 ^a	2	.269
Likelihood Ratio	4.586	2	.101
Linear-by-Linear Association	.181	1	.671
N of Valid Cases	250		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.00.

Interpretation:

The Pearson Chi-Square test value is 0.188 with 2 degrees of freedom and an associated p-value of 0.911. This p-value is much greater than the conventional threshold of 0.05, which indicates that there is no statistically significant association between the type of influencer (celebrity vs. micro-influencer) and the type of engagement (like, comment, share, or not engaged).

We fail to reject the null hypothesis based on the Chi-Square test results. This means that there is no evidence to support the hypothesis (H1) that consumers are more likely to engage with posts from micro-influencers compared to those from celebrities. The engagement levels do not significantly differ between posts from micro-influencers and those from celebrities according to this analysis.

2. Objective:

To Analyze responses regarding brand perception changes after viewing influencer posts.

Hypothesis:

H2: There is a significant difference in brand perception change after viewing influencer posts between posts from celebrities and micro-influencers.

(H0): There is no significant difference in brand perception change after viewing influencer posts between posts from celebrities and micro-influencers.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
P10 * P4	250	100.0%	0	0.0%	250	100.0%

P10 * P4 Crosstabulation

Count		P4			Total
		More Positive	More Negative	No Change in Feelings	
P10	Celebrity Endorsment	158	10	32	200
	Micro-influencer Endorsment	42	0	8	50
Total		200	10	40	250

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.625 ^a	2	.269
Likelihood Ratio	4.586	2	.101
Linear-by-Linear Association	.181	1	.671
N of Valid Cases	250		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.00.

Interpretation:

The Pearson Chi-Square value is 2.625 with 2 degrees of freedom and a p-value of 0.269. This p-value is greater than the conventional threshold of 0.05, indicating that there is no statistically significant association between the type of influencer (celebrity vs. micro-influencer) and brand perception change.

We fail to reject the null hypothesis based on the Chi-Square test results. This means that there is no evidence to support the hypothesis (H2) that there is a significant difference in brand perception change after viewing influencer posts between posts from celebrities and micro-influencers. The brand perception changes do not significantly differ between posts from micro-influencers and those from celebrities according to this analysis.

3. Objective:

To Evaluate overall trustworthiness ratings for celebrities and micro-influencers.

Hypothesis:

H1: Micro-influencers are perceived as more trustworthy than celebrities in their endorsements.

H0: There is no significant difference in perceived trustworthiness between micro-influencers and celebrities in their endorsements.

Group Statistics

P10		N	Mean	Std. Deviation	Std. Error Mean
P9	Celebrity Endorsment	200	1.8250	.82326	.05821
	Micro-influencer Endorsment	50	2.1000	.76265	.10785

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference		
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
P9	Equal variances assumed	3.286	.071	-2.143	248	.017	.033	-.27500	.12833	-.52776	-.02224
	Equal variances not assumed			-2.244	80.035	.014	.028	-.27500	.12256	-.51890	-.03110

Independent Samples Effect Sizes

		Standardizer ^a	Point Estimate	95% Confidence Interval	
				Lower	Upper
P9	Cohen's d	.81165	-.339	-.650	-.027
	Hedges' correction	.81411	-.338	-.648	-.027
	Glass's delta	.76265	-.361	-.677	-.041

a. The denominator used in estimating the effect sizes.
 Cohen's d uses the pooled standard deviation.
 Hedges' correction uses the pooled standard deviation, plus a correction factor.
 Glass's delta uses the sample standard deviation of the control (i.e., the second) group.

Interpretation:

The p-value for the t-test is 0.033, which is less than the conventional threshold of 0.05. This indicates that there is a statistically significant difference in the perceived trustworthiness between micro-influencers and celebrities.

Mean Difference: The mean trustworthiness score for micro-influencers is 0.27500 units lower than that for celebrities.

Confidence Interval: The 95% confidence interval for the mean difference is between -0.52776 and -0.02224, meaning we are 95% confident that the true difference in means lies within this range.

Based on the results, we reject the null hypothesis (H0) and accept the alternative hypothesis (H1). This means that there is a statistically significant difference in perceived trustworthiness, with micro-influencers being perceived as more trustworthy than celebrities in their endorsements.

Findings:

Based on the comprehensive analysis of influencer marketing comparing celebrities and micro-influencers, several key findings emerge:

1. Engagement Levels: There is no significant difference in consumer engagement (like, comment, share) between posts from micro-influencers and those from celebrities. Despite the common perception that micro-influencers may foster higher engagement due to their niche audiences, the study found no statistical evidence supporting this hypothesis.
2. Brand Perception Change: Brand perception changes similarly after exposure to influencer posts, regardless of whether the influencer is a celebrity or a micro-

influencer. This suggests that consumers' perceptions of brands are influenced similarly by both types of influencers, indicating a level playing field in terms of shaping brand image through influencer endorsements.

3. **Trustworthiness:** Micro-influencers are perceived as more trustworthy than celebrities in their endorsements. The study revealed a statistically significant difference in perceived trustworthiness, with micro-influencers scoring higher in authenticity and credibility compared to celebrities. This finding underscores the potential advantage of micro-influencers in building trust with their audience, which is crucial for effective influencer marketing campaigns.
4. **Implications for Influencer Marketing Strategies: Diversification:** Brands should consider incorporating both celebrities and micro-influencers into their influencer marketing strategies. While engagement levels may not differ significantly, micro-influencers offer a distinct advantage in perceived trustworthiness, which can enhance brand credibility and consumer loyalty.

Targeting Specific Goals: Micro-influencers may be particularly effective depending on campaign objectives, such as reaching niche markets or enhancing brand authenticity.

Cost-Effectiveness: Micro-influencers often provide higher return on investment (ROI) due to lower costs and comparable effectiveness in engagement and brand perception change.

CONCLUSION

In conclusion, this study explored the dynamics of influencer marketing by comparing the effectiveness of micro-influencers and celebrities across engagement levels, brand perception changes, and perceived trustworthiness. The findings provide several key insights:

1. **Engagement Levels:** Contrary to popular belief, there was no significant difference in consumer engagement (like, comment, share) between posts from micro-influencers and celebrities. Both influencer types elicited comparable levels of interaction from their audiences.
2. **Brand Perception Changes:** The study found that brand perception changes similarly after exposure to influencer posts, regardless of whether the influencer was a micro-influencer or a celebrity. This suggests that consumers' perceptions of brands are influenced similarly by both influencer categories.
3. **Trustworthiness:** Micro-influencers were perceived as more trustworthy than celebrities in their endorsements. This significant difference underscores the advantage micro-influencers hold in building authenticity and credibility with their audiences, crucial for effective influencer marketing campaigns.

References

- 1) Sinha, R., Nair, R. K., Naik, V., Ganatra, V., Singri, P., Singh, P., ... Kaakandikar, R. (2021). New norm in consumer buying pattern: Online shopping swing amid the coronavirus pandemic. *International Journal of Accounting & Finance in Asia Pacific (IJAFAP)*, 4(2), 118-128.
- 2) Ganatra, V., Kaakandikar, R., Izzuddin, M., Kee, D. M. H., Zainuddin, N. B., Bukhari, M. A.-Z., ... Panwar, V. (2021). The Impact of Food Delivery Apps on Customer Perceived Value Among University Students. *Journal of the Community Development in Asia*, 4(3), 68-78.

- 3) Espinoza, M. C., Ganatra, V., Prasanth, K., Sinha, R., Montañez, C. E. O., Sunil, K. M., ... Kaakandikar, R. (2021). Consumer behavior analysis on online and offline shopping during pandemic situation. *International Journal of Accounting & Finance in Asia Pacific (IJAFAP)*, 4(3), 75-87.
- 4) Espinoza, M. C., Nair, R. K., Mulani, R., Kaakandikar, R., Quispe, A., Riva, F.,... (2021). The effects of Covid19 pandemic on the tourism sector. *International Journal of Tourism and Hospitality in Asia Pacific (IJTHAP)*, 4(3), 115-121.
- 5) Hasaneya, R., Mohammed, K., Shankar, S., Fernando, I., Sonambekar, C., Garg, N., ... (2023). Assessing the Effects of the COVID-19 Pandemic on the Aviation Sector and Exploring Strategies for Industry Recovery. *International Journal of Tourism and Hospitality in Asia Pacific (IJTHAP)*, 6(3), 18-28.
- 6) Marotrao, K. R. (2017). A Performance Analysis of Select Public and Private Mutual Funds. Presented at [Conference Name], Nanded.
- 7) Deshpande, R. K., Nangare, V. V., Sawant, A. P., & Nangare, A. M. (2023). Impact of covid 19 on pradhan mantri mudra yojana. *Academy of Accounting and Financial Studies Journal*, 27(2), 01-Jun.
- 8) Kaakandikar, R., Karande, B. M., Nevase, R. R., & Kadam, O. B. (2023). A Study On The Customer Level Of Satisfaction Towards Café Coffee Day Product And Service In Pune City. *Central European Management Journal (CEMJ)*, 31(1), 632-638.
- 9) Kaakandikar, R. (2023). Study of customer satisfaction of star market. *Multidisciplinary Journal of Educational Research*, 13(1), 248-250.
- 10) kaakandikar, r., & gawande, r. (2023). unveiling the virtual frontier: exploring the dynamics, challenges, and opportunities of remote work and virtual teams community practitioner, 20(7), 136-146.
- 11) Kaakandikar, R., Ghadage, A. H., Poman, A., & Gawande, R. (2023). The evolving landscape of esg factors in sustainable finance: a literature review. *Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/Journal of Tianjin University Science and Technology*, 56(11), 88-95.
- 12) Espinoza, M. C., Ganatra, V., Prasanth, K., Sinha, R., Montañez, C. E. O., Sunil, K. M., & Kaakandikar, R. (2021). Consumer Behavior Analysis on Online and Offline Shopping During Pandemic Situation. *International Journal of Accounting & Finance in Asia Pasific*, 4(3). <https://doi.org/10.32535/ijafap.v4i3.1208>
- 13) Espinoza, M. C., Nair, R. K., Mulani, R., Kaakandikar, R., Quispe, A., & Riva, F. (2021). The Effects of Covid19 Pandemic on Tourism Sector. *International Journal of Tourism and Hospitality in Asia Pasific*, 4(3). <https://doi.org/10.32535/ijthap.v4i3.1213>
- 14) Ganatra, V., Kaakandikar, R., Izzuddin, M., Kee, D. M. H., Bt Zainuddin, N., Bukhari, M. A.-Z., Nurhakim, M. A., & Panwar, V. (2021). The Impact of Food Delivery Apps on Customer Perceived Value Among University Students. *Journal of The Community Development in Asia*, 4(3). <https://doi.org/10.32535/jcda.v4i3.1182>
- 15) Shamout, M. D., Sivaprasad, R., Ramya, N., Pande, S., Kaakandikar, R., & Fahlevi, M. (2022). Optical Flow-based Tracking of Vehicles using Adaptive Particle Filter Target Tracking Algorithm based for Accident Prevention. *International Conference on Automation, Computing and Renewable Systems, ICACRS 2022 - Proceedings*. <https://doi.org/10.1109/ICACRS55517.2022.10029204>
- 16) Sinha, R., Nair, R. K., Naik, V., Ganatra, V., Singri, P., Singh, P., Kamble, A. R., Kaakandikar, R., KJ, S., & Modawal, I. (2021). New Norm in Consumer Buying Pattern: Online Shopping Swing amid the Coronavirus Pandemic. *International Journal of Accounting & Finance in Asia Pasific*, 4(2). <https://doi.org/10.32535/ijafap.v4i2.1119>

Date: 22/08/2023

To,

The Director,

ZIMCA, Pune

Subject: Request for Research Paper Publication Fee Sanction.

Respected Sir,

I am writing to request the sanction of the publication fee for my research paper titled "Education 4.0 and Future Education", which has been accepted for publication in The International Journal of Learner Diversity and Identities dated Aug 16, 2023, with Online ISSN No 2327-0128. The publication of this research paper in The International Journal of Learner Diversity and Identities will significantly enhance the visibility and reputation of our MBA department. It will also contribute to the advancement of knowledge in the field and positively on the institution's commitment to academic excellence and research dissemination. The research findings presented in this paper are the result of thorough study and analysis and have considerable value for our ongoing and future projects.

The total fee required for the publication is Rs 1500/- I kindly request the sanction of this amount to facilitate the timely publication of the paper.

The publication of this paper will bring recognition and prestige to enhance our academic standing and institutional reputation and provide a valuable resource for peers and scholars in the field. I am committed to sharing the findings and insights from this research with our team to ensure it benefits our collective goals and objectives.

Thank you for considering my request. I look forward to your positive response.

Sincerely,


Prof. Vikrant V Nangare.

Assistant Professors, MBA Department

ZIMCA, Pune.



ZEAL INSTITUTE OF MANAGEMENT & COMPUTER APPLICATION

ZEAL EDUCATION SOCIETY'S

Sr. No.:

CASH PAYMENT VOUCHER

Date :

Paid to : Mr. Vikrant . V. Nangare .

DEBIT ACCOUNT HEAD

DEBIT ACCOUNT HEAD	SECTION NAME	AMOUNT
Being Payment made towards Conference / Workshop Registration fee paid. " Education 4.0 and future Education "		1500/-
		₹
		1500/-

Rs. In words : One thousand five hundred only

Being

[Signature]
Clerk

[Signature]
Accountant

[Signature]
Authorised Signatory

[Signature]
Receiver's Signature



Source details

[Feedback >](#) [Compare sources >](#)

International Journal of Learner Diversity and Identities

Years currently covered by Scopus: from 2013 to 2025

Publisher: Common Ground Research Networks

ISSN: 2327-0128 E-ISSN: 2327-2627

Subject area: [Social Sciences: Cultural Studies](#) [Social Sciences: Education](#)

Source type: Journal

[View all documents >](#)

[Set document alert](#)

[Save to source list](#)

CiteScore 2023
0.8 ⓘ

SJR 2023
0.113 ⓘ

SNIP 2023
0.269 ⓘ

[CiteScore](#) [CiteScore rank & trend](#) [Scopus content coverage](#)

CiteScore 2023



CiteScoreTracker 2024 ⓘ

Date: 30/08/2023.

To,
The Director,
ZIMCA, Pune

Subject: Request for Research Paper Publication Fee Sanction.

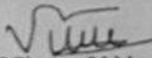
Respected Sir,

We are writing to request financial assistance to cover the expenses associated with the publication of our research findings. Our research paper, titled "DIGITAL TWINS: CHANGING FACE OF SMART CITIES", has been accepted for publication in Madhya Pradesh Journal of Social Sciences dated Aug 26, 2023, with Online ISSN No 0973-855X. The publication of this paper will significantly enhance the visibility and impact of our research within the scientific community. It will also contribute to the advancement of knowledge in the field of academic excellence and research dissemination. The total cost required for the publication is Rs 1500/-. We kindly request financial assistance to cover these expenses to ensure the timely publication of our research.

We believe that the publication of this paper will bring recognition and prestige to our department/organization and provide a valuable resource for peers and scholars in the field. We are committed to disseminating the findings and insights from this research to benefit our collective goals and objectives.

We appreciate your consideration of our request and look forward to a positive response.


Sincerely,



Prof. Vikrant V Nangare.

Assistant Professors, MBA Department

ZIMCA, Pune.

Approved




ZEAL EDUCATION SOCIETY'S
ZEAL INSTITUTE OF MANAGEMENT & COMPUTER APPLICATION

Sr. No.:

CASH PAYMENT VOUCHER

Date :

Paid to : *Mr. Vikrant V. Nangare*

DEBIT ACCOUNT HEAD

SECTION NAME

AMOUNT

*Being payment made towards
 conference/workshop registration fee.
 Paid. Digitized Twins: Changing face
 at smart cities*

1500/-

1500/-

Rs. In words : *One Thousand Five Hundred*

Being

[Signature]

Authorised Signatory

[Signature]

Accountant

[Signature]
 Receivers Signature

Clerk



Source details

International Journal of Learner Diversity and Identities

Years currently covered by Scopus: from 2013 to 2025

Publisher: Common Ground Research Networks

ISSN: 2327-0128 E-ISSN: 2327-2627

Subject area: [Social Sciences: Cultural Studies](#) [Social Sciences: Education](#)

Source type: Journal

[View all documents >](#)
[Set document alert](#)
[Save to source list](#)

CiteScore 2023

0.8



SJR 2023

0.113



SNIP 2023

0.269



[CiteScore](#) [CiteScore rank & trend](#) [Scopus content coverage](#)

CiteScore 2023 ▼

$$0.8 = \frac{35 \text{ Citations } 2020 - 2023}{43 \text{ Documents } 2020 - 2023}$$

Calculated on 05 May, 2024

CiteScoreTracker 2024 ⓘ

$$0.8 = \frac{37 \text{ Citations to date}}{48 \text{ Documents to date}}$$

Last updated on 05 November, 2024 • Updated monthly

CiteScore rank 2023 ⓘ

Category	Rank	Percentile
Social Sciences		
└ Cultural Studies	#410/1304	68th
Social Sciences		
└ Education	#1194/1543	22nd

[View CiteScore methodology >](#) [CiteScore FAQ >](#) [Add CiteScore to your site](#)

About Scopus

[What is Scopus](#)

[Content coverage](#)

[Scopus blog](#)

[Scopus API](#)

[Privacy matters](#)

Language

[日本語版を表示する](#)

[查看简体中文版本](#)

[查看繁體中文版本](#)

[Просмотр версии на русском языке](#)

Customer Service

[Help](#)

[Tutorials](#)

[Contact us](#)

ELSEVIER

[Terms and conditions](#) [Privacy policy](#) [Cookies settings](#)

All content on this site: Copyright © 2024 Elsevier B.V. [↗](#), its licensors, and contributors. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For all open access content, the relevant licensing terms apply.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies [↗](#).



See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/382066652>

DIGITAL TWINS CHANGING FACE OF SMART CITIES june 24 UGC Care

Article · June 2024

CITATIONS

0

READS

61

2 authors:



Vikrant Nangare
Zeal Education Society

18 PUBLICATIONS 4 CITATIONS

[SEE PROFILE](#)



Sachin Ayarekar
Bharati Vidyapeeth Deemed University

17 PUBLICATIONS 12 CITATIONS

[SEE PROFILE](#)

DIGITAL TWINS: CHANGING FACE OF SMART CITIES

Dr. Vikrant V. Nangare

Assistant Professor, Zeal Institute of Management and Computer Application, Pune

Dr. Umesh S. Kollimath

Associate Professor, SBSPM's APIMR Ambegaon, Pune

Dr. Sachin Ayarekar

Assistant Professor, IMED, Pune

ABSTRACT:

Although some people are unfamiliar with the term "digital twins," they are becoming increasingly important in today's environment. These digital representations are transforming the development, monitoring, and maintenance of tangible assets such as cars and buildings. The use of digital twins in the construction industry, for example, spans the duration of a whole project. Sustainable and low-cost building is accomplished by careful planning and construction, frequent maintenance and upgrades, and, finally, decommissioning and dismantling. Digital twins are being used in novel ways in smart cities. Data obtained through the establishment of a digital twin ecosystem can be used to improve municipal services such as roads, public transportation, buildings, streetlights, waste management, power, and more. Connecting these elements of a city to a digital counterpart in the cloud simplifies monitoring and problem detection. As a result, in this article, we focus on digital twin technologies to overcome the limitations associated with current implementation technologies, the significance of digital twins in smart cities, the power of digital twins in smart cities, and the challenges of digital twin cities. The problems, uses, and enabling technologies for AI, the Internet of Things (IoT), and Digital Twins are discussed. A literature review of Digital Twins in Smart Cities is conducted, resulting in a categorical evaluation of recent research papers. This study examines the role of digital twins in the development of smart cities, as well as the Smart Cities Market Size, Share, and Growth.

INTRODUCTION:

A digital twin of infrastructure is a digital representation of an infrastructure asset, facility, or system that enables you to understand its current status and maximise its future performance. A digital twin provides the framework for virtualizing use cases and workflows by utilising a current and trusted digital version of the physical infrastructure. Simulations of various scenarios using digital twin technology can assist in identifying dangers. However, open digital twin architecture with seamless integration capabilities is necessary for scalability. It enables users to link diverse data kinds and formats, as well as systems from numerous suppliers. A city can become a 'smart city' through this digitalization process. Understanding how to handle and use data more efficiently to support decision-making and digital services in all aspects of the design and delivery lifecycle is one of the trademarks of a smart city.

Smart cities are turning digital by adopting technologies such as the Internet of Things (IoT), 5G, artificial intelligence, machine learning, and urban digital twins to make data-driven decisions and provide improved experiences and services to businesses and citizens alike. Smart cities prioritise and invest in technology, leveraging data and efforts to improve and align city investments and operations with sustainability and resilience aims. Such cities often employ a chief digital or

information officer and a digitisation unit that reports to the city government. To build resilient and sustainable urban infrastructure, those in the civil engineering and construction industries must have a thorough understanding of the urban environment and ecosystem, as well as the ability to perform event impact analysis and operational awareness with defined risk mitigation procedures. All three of these domains are supported by digital twin technology, which combines important data sources into a federated perspective — regardless of data type or format — and allows for scenario simulations. Furthermore, digital twins allow engineers to connect real-time sensors for situational awareness, which aids operational decisions.

OBJECTIVES OF THE STUDY:

1. To study the technology trends and future developments of smart cities.
2. To understand the significance of digital twins in smart cities.
3. To understand the challenges of challenges and opportunities in implementing Digital Twins for developing smart cities.
4. To give suggestions to the industry for developing smart cities with digital twins.

RESEARCH METHODOLOGY:

To reach the research's overall purpose, both research methods and a review of the literature are required. This research study has been refined using secondary data. Researchers acquired the specified literature from a variety of sources, including EBSCO, J-Gate, FED Gate, INFLIBNET, Vidyanidhi, Google Scholar, and DOAJ. Furthermore, the researcher gathered information about the role of digital twins in the development of smart cities by reading reports from business magazines, newspapers, statistical summaries, journals, periodicals, and so on. While gathering data, the researcher considered the following points.

- Digital Twins are a concept.
- The connection between Digital Twins and Emerging Markets for Smart Cities.
- The problems of the digital twin city
- The Importance of Digital Twins in Smart Cities

LITERATURE REVIEW:

1. Ibrar Yaqoob & Khaled Salah- Researchers investigate the possibility of digital twins in taking smart cities to the next level in this paper. The researcher emphasises some of the primary benefits of using digital twins in smart city situations. A researcher outlines the networking and communication technologies that facilitate digital twin connectivity. Furthermore, the researcher offers interesting comments on the significance of digital twins in several smart city fields. Finally, the researchers discuss several unresolved issues as well as recommendations.

2. Shubham Deshpande & Madhavi Damle- Before executing 'Physical Infrastructure' as a cornerstone of a Smart city, the researcher offers a Digital twin-based simulation approach, virtual trails. A comparison of existing technique vs a simulation-proposed approach for effective

implementation and benefits with the magnitude of benefits obtained. The simulation scope in smart city implementation is centred on the micro-level.

3. Ran Bi- This research paper investigates the application of the digital twin in smart construction, as well as its benefits and drawbacks, and explores the research issue using a case study technique, demonstrating the importance of the digital twin for smart building. The article also states that while the digital twin offers advantages such as accurate mapping, interaction between reality and reality, and intelligent intervention in the building business, it also has some limitations in terms of data awareness and software.

4. Ahsan Waqar & Idris Othman- This research uses a mixed technique research design that includes an interview, a pilot survey, and the main survey. To begin, the researcher identified impediments stated in the literature and eliminated insignificant ones via interviews. Following that, the researcher used an Exploratory Factor Analysis (EFA) on the pilot survey findings to fine-tune the factors. Finally, the researchers used Structural Equation Modelling (SEM) to analyse the major survey data in order to create a model that highlights impediments to DTT deployment in Malaysian smart city development. According to the research findings, there are 13 highly significant barriers that are classified into four formative structures. Personalization hurdles were found to be extremely critical, whereas operational barriers were found to be less relevant for DTT adoption in Malaysian smart city development.

5. Diego M. Botín-Sanabria & Adriana-Simona Mihaita- A digital twin is a virtual version of a physical object or process that may collect information from its real-world surroundings in order to represent, validate, and mimic the physical twin's current and future behaviour. It plays an important role in data-driven decision making, complex system monitoring, product validation and simulation, and object lifecycle management. As an emerging technology, its use is becoming more widespread in a variety of fields such as industrial, automotive, medicine, smart cities, and so on. The goal of this systematic literature review is to give a comprehensive understanding of DT technology, as well as its implementation issues and limitations in the most relevant domains and applications in engineering and beyond.

6. Abdelhadi Belfadel & Sebastian Hörll- Digital twins have recently gained a lot of attention for their ability to support enhanced experimentation, modelling, and decision-making for on-demand logistical operations. Questions remain about how to implement these in a mixed public-private stakeholder framework for urban logistics management. The lack of a specialised framework for city logistics with a model library for data merging, combining real and virtual data sharing, according to the researchers, can jeopardise the timely implementation of digital twin technology. Researchers fill this gap by giving a systematic analysis of the literature, establishing a conceptual framework for digital twin applications in urban logistics, and providing use case scenarios for its demonstration. Together, these should help to develop the technological implementation of digital twins in the context of sustainable city logistics.

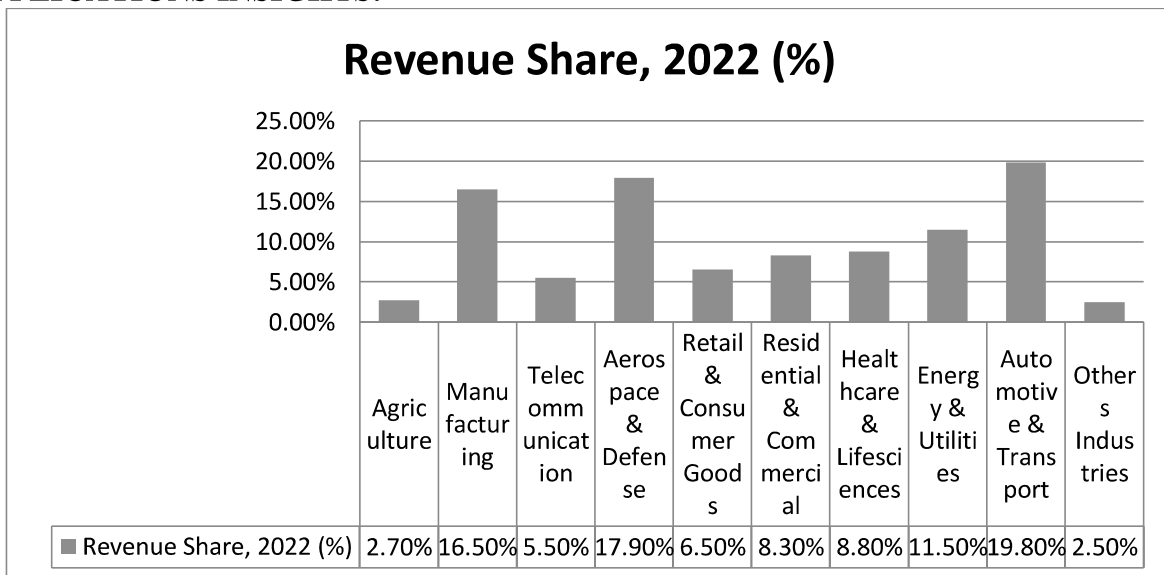
7. Zhihan Lyu & Anna J. Gander- The purpose of this research is to investigate the use of Digital Twins in cities and their future development prospects based on the establishment of Smart Cities. Furthermore, Digital Twins technology is examined in relation to the methodical creation of urban smart public service facilities. The intelligence of public utilities is studied in the context of urban public drainage systems, public lighting systems, and intelligent traffic systems. Finally, the above

capacities may be integrated with future Digital Twins technology. The analysis is carried out from the social, economic, and environmental aspects of sustainable development by merging communication technology and information technology. This study serves as a model for the subsequent intelligent and systematic development of smart city and sustainable city infrastructure.

DIGITAL TWIN:

A digital twin is a digital model or clone of a physical object, such as a product, an organisation, or even an entire city. It has a wide range of uses, from conducting organisational health assessments to improving service design and enabling more effective city management. In the framework of a smart city, a digital of the city collects information from the built environment on a continuous basis (by technology such as sensors, drones, or mobile devices). It is made feasible by the use of distant communication technologies like as WiFi and Bluetooth, as well as internet of things (IoT) sensors that collect data from the physical environment in order to reconstruct an identical digital duplicate of the city. Aside from IoT, the use of Big Data, Artificial Intelligence (AI), Cloud Computing, machine learning, and advanced analytics improves the accuracy and dynamism of this replica, allowing static, historical, and real-time data to be processed and synthesised almost instantly, providing valuable insights into the city's performance. As a result, a Digital Twin can be viewed as a 'strategy accelerator,' assisting public sector organisations in more effectively identifying insights and connections and driving to better solutions with greater confidence.

APPLICATIONS INSIGHTS:



Based on application, the automotive and transportation segment has the largest market revenue share with grown technologies developed in electric vehicles and enhanced production of electric vehicles due to an increase in market acceptance of the developed technology and high customer demand for electric vehicles and enhanced production of engines and rise in development and

designing of the automobile with improved connectivity, i expanding digital twin utilisation and product growth contribute to drive the digital twin market with an expanding number of applications.

SIGNIFICANCE OF DIGITAL TWINS IN SMART CITIES:

Digital twins hold great promise as significant instruments for urban sustainability since they allow researchers to duplicate a specific city environment and replicate the characteristics or processes that affect it, such as traffic or emissions. Smart cities have positioned themselves as the ideal solution to the environmental and social issues that have arisen as a result of recent rapid urbanisation. They are the way forward in terms of improving inhabitants' quality of life while also creating a more sustainable city model. A replica, such as the digital twin, which is regularly updated with data from its actual twin, enables users to examine data, monitor systems, and simulate as if they were working with the real thing.

It is a manufacturing-related approach that permits a new asset to be tested without the risk of it failing during the physical asset's testing. Today, its applications range from testing new designs or venues to performing health diagnostics, providing citizens access to public spaces, and enabling more effective city management, among many others. Digital twins in smart cities continuously collect information from the environment via sensors, drones, and mobile devices, as well as vehicles, buildings, infrastructure, or people. To this, IoT data is added, which is supplemented by AI and advanced analytics.

These tools can nearly instantly process static, historical, and synthesised data to deliver useful insights into city performance. As a result, a digital twin accelerates these efforts, allowing public sector organisations to find insights and linkages more effectively and with higher certainty. Cities that can harness this technology and reap its benefits will prosper the most. Moving away from the traditional approach to city planning has numerous advantages, including the opportunity to compare virtual design with smart maps powered by geospatial analytics. Geo-referenced data that is multiple, big, and complicated can be visualised, processed, and analysed. As the physical object's condition changes, the digital twin updates dynamically in real-time, saving time and enhancing responsiveness.

THE DIGITAL TWIN CITY'S CHALLENGES:

1. The resource and corporate sustainability problem:

The digital twin city requires interdisciplinary expertise from urban management, demand analysis, digital technology, and algorithm modelling to fully understand its potential. Currently, the city is dominated by IT professionals, highlighting the need for interdisciplinary talent in algorithm modelling and business analysis. The digital twin city also requires interoperable knowledge bases and industry models in various aspects of data, models, and interaction. The high research costs of digital twin cities make it difficult to translate into practical benefits. A wider range of citizens, institutions, and market players is needed to innovate and form a risk-sharing development pattern.

2. The challenge of data governance and privacy concerns

Urban IoT sensing's limited data-collection capabilities can lead to insufficient application depth in digital twin cities. Inconsistent multidimensional and multi-scale data collection and uneven

construction of IoT facilities may result in ex ante models and virtual simulations. Lack of standardized governance of varied urban multisource data also hinders integration and fusion, leading to low data quality and insufficient governance effectiveness. Centralized processing of large amounts of data increases the risk of data security failures and privacy leakage.

3. The challenge of scientific understanding and value perception

Digital twin city technology is undergoing rapid development and change, with its potential being explored from various perspectives. Over emphasizing 3D modelling and visualization of city components while overlooking simulation extrapolation and virtual interaction could lead to unbalanced development. The development of digital twin cities is determined by supply and demand, and some cities focus too much on fine reproduction without in-depth analysis of application requirements. This could result in disconnect in urban planning, construction, management, and services, reducing digital twin technology to a flashy ornament.

THE POWER OF DIGITAL TWINS IN SMART CITIES:

- Our cities, like the rest of the globe, are rapidly changing. The notion of Smart Cities has gained traction, promising a future that is interconnected, sustainable, and efficient. The innovative technology of digital twins is at the centre of this transformation. Decision-makers may optimise urban planning, foresee and avert issues, and make data-driven decisions by constructing a digital model that replicates the physical world. When integrated into Smart City frameworks, digital twins provide a plethora of benefits. Here are some significant benefits:
- Predictive Maintenance: Cities can predict future issues and conduct proactive maintenance by continuously monitoring and evaluating data from digital twins. This method decreases downtime, increases asset longevity, and lowers maintenance expenses.
- Improved Urban Planning: Digital twins allow city planners to simulate multiple scenarios and assess the impact of various measures. Visualising the effects of suggested changes improves the effectiveness and efficiency of urban planning.
- Resilience and disaster Response: Cities can use digital twins to simulate disaster situations, improve readiness, and respond quickly to crises. Authorities can make educated judgements and maintain public safety by analysing real-time data.
- Improved Resource Management: Digital twins give real-time data and analytics on everything from energy use to waste management, helping cities to optimise resource allocation, decrease inefficiencies, and promote sustainability.
- Improved public Engagement: By providing accessible and interactive venues, digital twins enable greater public involvement. Citizens can actively participate in urban planning, express their concerns, and make decisions.

RECOMMENDATIONS FOR INDUSTRY:

1. The threshold for building digital twin city scenes should be lowered to attract more practitioners and stakeholders. This could involve government departments building public service platforms, promoting open source software, and developing SaaS micro-applications. This could help city managers, operators, and residents collaborate to enhance digital twin scenarios and improve business processes.

2. The digital twin field requires unique advantages to foster a prosperous innovation ecosystem. By bringing together people with common interests, a larger crowd increases the chance of innovation and benefits. Key technologies and industrial elements, such as IoT perception, visualization, and data fusion, can be utilized to cultivate individual strengths, break industry competition, establish incremental business models, and open up new business spaces.
3. The focus should be on standard-led industrial implementation and forming interconnected partnerships. Standardization should play a crucial role in promoting digital twin cities, refining common requirements and normative standards from advanced regions like the US, China, and Singapore. Cooperation on digital twin city reference architecture, city information models, and maturity should be strengthened.
4. Government and enterprises should collaborate on business model innovation to expand the "to C" market and transform from a one-time project relationship to a long-term operation partnership. The digital twin city cloud service market should be actively developed, providing on-demand supply and customized designs for digital twin SaaS services. The service can be extended from "to G" to "to B" and "to C" services depending on the precision of the twin city model. The digital twin city combines ICT technology and human civilization, creating a green system with less pollution, waste, and sustainability. Block chain, digital watermarking, and privacy enhancement will support sustainable development. In 2022-2023, CICT and the World Economic Forum will promote integration and innovation among industry, academia, research, and application, promoting exchanges and cooperation among governments, enterprises, and academia.

CONCLUSION:

Smart cities are metropolitan regions that use information and communication technology, sensors, and other electronic devices that are linked to the Internet of Things to collect large amounts of data that can be used to optimise resources and services. The digital-twin technology appears as the best option for smart cities. As a result, architects and designers agree that digital twins are a game changer in the design and operation of smart cities' buildings, transport systems, road landscapes, and more. Digital twins have found their initial application in smart cities to better comprehend the city's transport capabilities, which range from bike sensor data to parking and air traffic availability, but have the potential to spread to architecture in the near future. When organisations can easily employ digital twins to boost productivity and minimise expenses, they will become more popular. Processes, planning, design, construction, and operation and maintenance operations in smart cities are progressively digitised and digital twins serve the purpose well. We conclude that there are significant opportunities for scaling digital twins, which have the ability to benefit the city, its residents, and clients.

REFERENCES:

1. Li Tao, & Song Zhanyu, & Jinjin Ming, & Zhang Hongsheng, & Li Keyi, Carbon counting and reduction measures for the whole life cycle of buildings under the "double carbon" target—China Unicom's promotion of building energy efficiency to help low-carbon development. *China Construction Informatization*, (08), 2022, pp. 39–41.
2. Chang Pei & Zhang Qi, Analysis of the current situation of China's construction industry under the influence of the new crown epidemic. *Anhui Construction*, vol. 28(09), 2021, pp. 258-259.

3. Rajat, A., & Shankar C., & Mukund. Imagining construction's digital future, 2016. Online: Sridhar<https://www.mckinsey.com/business-functions/operations/our-insights/imaginingconstructions-digital-future>
4. Zhang Snap, & Xia Zilin, National speed skating museum "ice ribbon" "super brain" online. Middle school students reading, (05), 2022, pp. 15–16.
5. Liu Zhanshi, & Shi Guoliang, & Du Xiuli, & Jiao Zedong, Intelligent operation and maintenance theoretical system and implementation method based on digital twin. Journal of Civil and Environmental Engineering (in English and Chinese), 2022.
6. Terra Digital Technology (Beijing) Co., Intelligent Lingang: Building a "six-energy" system. China Construction Informatization, (17), 2021, pp. 27–29.
7. Xu Yan, & Deng Yang, & Yuan Huanqing, Smart city construction under the empowerment of digital twin technology. Urban and rural construction, (03), 2022, pp. 54–56.
8. Aaron, P., & Lane, W. Industry 4.0 and the digital twin, 2017. Online: <https://www2.deloitte.com/us/en/insights/focus/industry-4-0/digital-twin-technology-smart-factory.html>
9. Zhang Xinsheng, Design and implementation of a workshop control system based on digital twin. Zhengzhou University, 2018, pp. 44–70 .
10. Niu Weirui, & Wang Binwu, Comparative study on the development of domestic and foreign construction industry. Construction, (07), 2022, pp. 12–17.

Date: 28/09/2023.

To,

The Director,

ZIMCA, Pune.

Subject: Request for Research Paper Publication Fee Sanction.

Respected Sir,

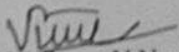
With reference to the subject mentioned above, we, Prof. Vikrant V Nangare (MBA Dept.), are pleased to inform you that our research paper titled Addressing Mental Health Needs in Public Health Management: Bridging Gaps in Services and Support has been accepted by publication of International Journal of Medical Toxicology and Legal Medicine dated Sept 15, 2023, with Online ISSN No 0972-0448.

We are writing to request financial assistance to cover the expenses associated with the publication of our research findings. As per institute policy, we kindly request the sanction of a publication fee amounting to Rs.2000 /-.

Your support in this matter would not only enable our participation but also reflect positively on the institution's commitment to academic excellence and research dissemination. We are confident that the publication of our research paper in this journal will significantly enhance our academic standing and institutional reputation.

We respectfully request your kind approval of this request. Thank you for considering our appeal.


Yours truly,


Prof. Vikrant V Nangare.

Assistant Professors, MBA Department.

ZIMCA, Pune.



Approved


ZEAL EDUCATION SOCIETY'S
ZEAL INSTITUTE OF MANAGEMENT & COMPUTER APPLICATION

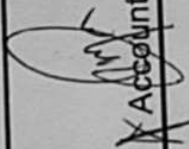
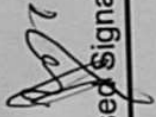

Sr. No. : _____ **CASH PAYMENT VOUCHER** **Date :** _____

Paid to : Mr. Vikrant V. Nangare,

DEBIT ACCOUNT HEAD		SECTION NAME	AMOUNT
Being Payment made towards conference workshop Registration fee paid. Addressing Mental Health Needs in Public. Health Management: Building Gaps in service and support			2000/-
			2000/-

Rs. In words : Two Thousand only

Being

 **Accountant**
  **Authorised Signatory**
  **Receiver's Signature**

Clerk

Addressing Mental Health Needs in Public Health Management: Bridging Gaps in Services and Support

PDF (<https://ijmtlm.org/index.php/journal/article/view/73/65>)

Keywords:

Mental health, public health management, gaps in services, support, interventions, stigma, access to care, community-based support.

Sachin Ayarekar, Vikrant Nangare, Gaurav, Amol Pandurang Godge, Ramchandra Vasant Mahadik, Swati Desai

Abstract

Mental health issues represent a significant public health challenge globally, yet there remains a considerable gap in addressing these needs effectively within public health management systems. This paper explores the various dimensions of mental health within the context of public health management, focusing on identifying existing gaps in services and support. Drawing upon a comprehensive review of literature, this paper highlights the multifaceted nature of mental health challenges, including stigma, limited access to care, insufficient resources, and disparities in service provision. It examines the roles of different stakeholders, such as governments, healthcare providers, community organizations, and individuals, in addressing mental health needs. Moreover, this paper discusses potential strategies and interventions to bridge the existing gaps, including integrating mental health services into primary care, leveraging technology for remote interventions, promoting mental health literacy, and strengthening community-based support systems. By addressing these challenges and implementing effective interventions, public health management can better respond to the mental health needs of populations, ultimately contributing to improved well-being and reduced burden of mental illness.

Issue

Vol. 27 No. 1s (2024) (<https://ijmtlm.org/index.php/journal/issue/view/31>)

Section

Articles

Announcements

Call for Papers (<https://ijmtlm.org/index.php/journal/ann>)

Call for Papers for the New Issue.

Last Date of Submission: November 30th 2024

Make a Submission (<https://ijmtlm.org/index.php/journal/about/sut>)



(<https://www.scimagojr.com/journalsearch.php?q=25110&tip=sid&exact=no>)



(<https://www.scopus.com/sourceid/25110>)



1.1

2023 CiteScore

25th percentile

Powered by Scopus



(https://hjrs.hec.gov.pk/index.php?r=site%2Fresult&id=1073180#journal_result)

Home (<http://ijmtlm.org>)

Current Issue (<http://ijmtlm.org/index.php/journal/issue/current>)

Archives (<http://ijmtlm.org/index.php/journal/issue/archive>)

Contact Us (<http://ijmtlm.org/index.php/journal/about/contact>)

Downloads

About Scopus

[What is Scopus](#)

[Content coverage](#)

[Scopus blog](#)

[Scopus API](#)

[Privacy matters](#)

Language

[日本語版を表示する](#)

[查看简体中文版本](#)

[查看繁體中文版本](#)

[Просмотр версии на русском языке](#)

Customer Service

[Help](#)

[Tutorials](#)

[Contact us](#)

ELSEVIER

[Terms and conditions](#) [Privacy policy](#) [Cookies settings](#)

All content on this site: Copyright © 2024 Elsevier B.V. [↗](#), its licensors, and contributors. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For all open access content, the relevant licensing terms apply.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies [↗](#).





Source details

International Journal of Medical Toxicology and Legal Medicine

Years currently covered by Scopus: from 1999 to 2003, from 2005 to 2011, from 2017 to 2024

Publisher: Auricle Global Society of Education and Research

ISSN: 0972-0448 E-ISSN: 0974-4614

Subject area: Medicine: Pathology and Forensic Medicine Pharmacology, Toxicology and Pharmaceutics: Toxicology

Source type: Journal

- [View all documents >](#)
- [Set document alert](#)
- [Save to source list](#)

CiteScore 2023 **1.1**

SJR 2023 **0.283**

SNIP 2023 **0.365**

[CiteScore](#) [CiteScore rank & trend](#) [Scopus content coverage](#)

CiteScore 2023 ▼

$$1.1 = \frac{394 \text{ Citations } 2020 - 2023}{354 \text{ Documents } 2020 - 2023}$$

Calculated on 05 May, 2024

CiteScoreTracker 2024 ⓘ

$$0.9 = \frac{303 \text{ Citations to date}}{339 \text{ Documents to date}}$$

Last updated on 05 November, 2024 • Updated monthly

CiteScore rank 2023 ⓘ

Category	Rank	Percentile
Medicine		
Pathology and Forensic Medicine	#156/208	25th
Pharmacology, Toxicology and Pharmaceutics	#108/133	19th

[View CiteScore methodology >](#) [CiteScore FAQ >](#) [Add CiteScore to your site ↗](#)

Date: 20/08/2023

To,
The Director,
ZIMCA, Pune.

Subject: Request for Research Paper Publication Fee Sanction.

Respected Sir,

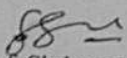
With reference to the subject mentioned above, I Prof. Shiram Ugale from (MBA Dept.), I am writing to request the sanction of the publication fee for our research paper titled "A study on Passenger Satisfaction towards emerging metro rail corporation in Pune city", which has been accepted for publication in Anveshak A Biannual Journal dated 1-January to June, 2023, with Online ISSN No 0378-4568.

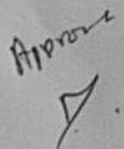
The publication of this research paper in The National Journal of Learner Diversity and Identities will significantly enhance the visibility and reputation of our MBA department. It will also contribute to the advancement of knowledge in the field and positively on the institution & commitment to academic excellence and research dissemination. The research findings presented in this paper are the result of thorough study and analysis and have considerable value for our ongoing and future projects. The total fee required for the publication is Rs 4000/- kindly request the sanction of this amount to facilitate the timely publication of the paper.

The publication of this paper will bring recognition and prestige to enhance our academic standing and institutional reputation and provide a valuable resource for peers and scholars in the field. I am committed to sharing the findings and insights from this research with our team to ensure it benefits our collective goals and objectives.

Thank you for considering my request. I look forward to your positive response.

Sincerely,


Prof. Shiram Ugale
Assistant Professor, MBA Department.
ZIMCA, Pune.



ZEAL EDUCATION SOCIETY'S
ZEAL INSTITUTE OF MANAGEMENT & COMPUTER APPLICATION

Sr. No.:

Date:

CASH PAYMENT VOUCHER

Paid to:

Mr. Shiram Ugalde

DEBIT ACCOUNT HEAD

SECTION NAME

AMOUNT

Being Payment made towards Con- ference / Workshop Registration fee paid	2000/-
A study on Passenger Satisfaction	}
Towards Emerging Metro Rail Cor- poration in Pune City	2000/-

Rs. In words:

Two Thousand Only

Being

[Signature]
Clerk

[Signature]
Accountant

[Signature]
Authorised Signatory

[Signature]
Receivers Signature



**SARDAR PATEL INSTITUTE OF
ECONOMIC AND SOCIAL RESEARCH**

anvesak

A bi-annual journal

CERTIFICATE OF PUBLICATION

This is to certify that the paper entitled

**“A STUDY ON PASSENGER SATISFACTION TOWARDS
EMERGING METRO RAIL CORPORATION IN PUNE CITY”**

Authored by

Prof. Shriram Ugale⁴

⁴Zeal institute of Management and Computer Application, Pune

University Grants Commission

Approved Journal

vol. **54** No. **01**

in

Anvesak A bi-annual Journal

UGC Care Group - 1

ISSN: 0378 - 4568

January – June 2024



A bi-annual journal