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Digital Sustainable Marketing: Examining The Role Of Social Media And E-Commerce In Scaling Rural Entrepreneurs In Jharkhand

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ABSTRACT

The role of digital sustainable marketing, including social media marketing, e-commerce adoption, digital infrastructure access, and sustainability-oriented digital practices, was examined in this study as factors that scale up rural entrepreneurs in Jharkhand. The research was based on quantitative research design, and the responses were obtained from a survey of 130 rural entrepreneurs. The research analyzed the impacts of digital tools on outgrowth, market expansion, digital marketing effectiveness, and business resilience. The study showed ambiguous results. Social media marketing, on the other hand, was found to have a significant but negative impact on enterprise growth, which was indicative of ineffective usage and poor digital skills. On the other hand, e-commerce adoption contributed to market expansion and business sustainability through organized logistics, packaging, and digital support systems. Although digital infrastructure and access are vital, they still negatively affect the digital marketing effectiveness, which highlights the connectivity and skill deficiency issue. Sustainable digital marketing practices played a prominent role in the growth of the businesses, and they also positively impacted by being the major contributor to the transparency of business operations and the minimization of the project's negative environmental impact. The research results highlight the need for skillful digital marketing users and, at the same time, underline the need for effective infrastructure that creates a vibrant and effective Jharkhand rural entrepreneurial ecosystem.

***Keywords*:** Digital sustainable marketing, rural entrepreneurship, social media marketing, e-commerce adoption, business resilience

1. Introduction

1.1 Background: Digital Transformation and Rural Entrepreneurship

The immense growth of digital technologies in India has been a major factor in changing the rural entrepreneurship scenario, and now these technologies are extensively used in states like Jharkhand, where the local economy consists of micro-enterprises, artisan communities, and self-help groups (SHGs). In the past selling, the constant increase of internet users, cheaper smartphones, and more accessible platforms have been the factors that have allowed small manufacturers to sell their products in larger markets that are not limited by geography (Patel, 2024). Digital sustainable marketing, characterized as the promotion of goods through digital channels that are economically viable, socially inclusive, and environmentally responsible, has become an indispensable tool for rural micro-entrepreneurs who are trying to survive in the modern competitive environment (Kotler et al., 2021).

The use of digital technologies in business activities has opened new avenues for rural Jharkhand, mostly relying on traditional crafts, agro-based products, forest produce, textile weaving, and small-scale food processing. In the beginning, these micro-scale producers were confined to local markets with exceptionally low customer reach, sporadic demand, and weak supply chains. These small entrepreneurs are now able to take advantage of social media like WhatsApp, Facebook, and Instagram, as well as e-commerce platforms such as Amazon Karigar, Flipkart Samarth, and regional digital marketplaces (Singh). Through a combination of digital storytelling, community engagement, and online catalogs, rural producers can not only attract niche customers but also integrate into wider economic networks and thus be able to better compete on digital shelves.

The advantages that accompany the digital transformation process have not yet reached all the parties involved equally. On the one hand, some businesspeople encounter (besides others) a growing sale, better exposure, and even a stable expansion of their firms. On the other hand, numerous others are still battling with unlearned digital skills, being poorly trained, having insufficient logistics, and dealing with complex platforms (Kumar et al., 2023). The socio-economic diversity of Jharkhand, characterized by tribal populations, isolated settlements, and underdeveloped infrastructure, makes the region an important one for analyzing the sustainable digital marketing process and identifying the beneficiaries.

1.2 The Role of Social Media and E-commerce in Scaling Rural Enterprises

Rural entrepreneurs have co-opted social media, firstly, as a marketing channel and, secondly, as a tool for building relationships. Direct communication, along with personalized sharing of products and promotions based on groups, can be done using WhatsApp. On the other hand, Facebook and Instagram are used for visual branding, product display, and content-based interactions (Chatterjee et al., 2021). The major transformation from the traditional marketing model of face-to-face interactions to that of digital-first strategies gives small entrepreneurs the advantage of getting real-time feedback from the market, building online communities, and storytelling through authenticity and local identity creation.

It is e-commerce that sets up a digital infrastructure to the greatest extent possible for selling products everywhere within and across states. More rural artists and producers from Jharkhand have been lining up to participate in the e-commerce programs that offer reduced entry barriers through support in logistics, digital training, packaging, and payment facilitation (Basak, 2024). The use of these platforms not only contributes to the increase in volumes but also aids in improving the processes of traceability, transparency, and sustainability as they allow for more efficient inventory management, less waste, and production cycles that are solely based on demand. Digital marketing and e-commerce are also making their contribution to environmental sustainability as they keep postponing the need for many physical trips, minimizing the number of intermediaries in the process, and allowing the establishment of local value chains that follow up

with the sustainable principles of development (UNCTAD, 2021). In the meantime, social media analytics, customer reviews, and online interaction statistics are giving rural businesses the power to take real-time data-driven decisions, which in turn reinforce the company's long-term resilience and sustainability (Hernández et al., 2024).

Moving to digital sustainable marketing is, however, not a hassle-free affair. Various issues, like the unreliability of internet connectivity across the board, not being aware of the situation, not being tech-savvy enough, and not having a stable digital infrastructure, keep hindering the process of adoption, especially among women entrepreneurs and first-time business owners. Besides, the highly competitive and algorithm-based nature of digital channels causes uncertainties that rural sellers must manage without sufficient digital skills or institutional backing.

1.3 Need for the Present Study: Jharkhand's Untapped Digital Potential

Digital entrepreneurship literature in India is slowly but surely gaining ground. Still, a limited region-specific study is conducted to investigate the impact of digital sustainable marketing on the rural enterprises of Jharkhand, a state with peculiar socio-cultural, geographic, and economic characteristics. The researchers have primarily focused on national or state-level digital adoption but have not investigated micro-level differences, entrepreneurs' experiences, or varying effects of social media and e-commerce on entrepreneurial growth (Mehrotra & Raman, 2021).

Besides, most of the previous research has been done on large or urban enterprises, thus neglecting the rural micro and nanotechnology entrepreneurs whose existences are characterized by the existence of structural barriers. In addition, the connection between digital marketing practices and measurable outcomes such as revenue growth, customer expansion, and sustainability indicators has not been established through empirical evidence. Understanding rural entrepreneurs in Jharkhand better in terms of their concept, adoption, and integration of digital sustainable marketing practices can be of great help to policymakers, development agencies, training institutions, and digital platform providers.

To begin with, the present study is going to fill the above-mentioned gaps in knowledge by a systematic analysis of the role of social media and e-commerce platforms in the rural entrepreneurs of Jharkhand, scaling up with sustainability and marketing perspectives. The research will investigate how these digital resources are helping rural areas become inclusive, good at building skills, and resilient in the long term. In this way, the research is contributing to the theoretical discussions about digital inclusion, and at the same time, it is providing practical implications for entrepreneurship development through a regionally grounded evidence base for future interventions.

2. The Significance of the Study

The research is important since it investigates how digital sustainable marketing can be a source of power for rural entrepreneurs in Jharkhand, a place where business growth has been limited by traditional markets, poor infrastructure, and a lack of customers. The study reveals how digital tools are changing marketing practices, increasing market access, and backing the sustainable growth of micro and small businesses, especially with social media and e-commerce platforms being analyzed. The research is beneficial in that it shows the path to digital adoption for rural producers, artisans, and self-help groups to create more inclusive opportunities, engage in larger economic networks, and position themselves to compete efficiently in contemporary markets.

The study also gives policymakers, NGOs, and other stakeholders involved in the digital platform development and capacity building a practical window into the situation. The results of the research can be a helpful guide in determining what types of training programs, digital literacy initiatives, and market linkage

interventions are most suitable for the specific socio-economic circumstances of Jharkhand's rural communities. In addition to that, the study identifies rural entrepreneurs' prospects and challenges in using social media and e-commerce, thereby helping to create a stronger support system for responsible, inclusive, and sustainable digital entrepreneurship. The research, therefore, lays down the ground for future strategies that are directed at not only securing the livelihoods of rural enterprises but also their operations through the promotion of innovation and the building of resilience over time.

3. Review of Literature

3.1 Digital Marketing and Social Media for Rural Micro-Entrepreneurs

A recent systematic review on rural micro-entrepreneurs in India shows the uneven but increasing adoption of digital marketing tools (social media, websites, online advertising) among rural business owners. The authors state that with the help of digital marketing, the market size, customer base, and the transparency for the entrepreneurs who used to be only in local markets would be expanded. The degree to which benefits accrue is determined by factors such as digital literacy, internet access, and awareness (Goel, 2024).

When viewed from a country-specific perspective, it can be said that women-led businesses in rural regions are the first to benefit from digital literacy and e-commerce. For instance, a study focusing on the context of Indian rural women entrepreneurs illustrates the scenario where access to e-commerce platforms for them means the market for their handmade, agricultural, or home-based products is not limited to local markets anymore. The researchers report that the adoption of digital tools by women entrepreneurs has led to improvements in operational efficiency, customer base expansion, and economic independence; However, the study also mentions obstacles such as poor internet connectivity, etc., that they still face (Padmannavar, 2011).

The qualitative studies on rural and semi-urban women micro-entrepreneurs in different Indian states reveal that the digital platforms (like WhatsApp Business, social media), which are low-cost, have been creatively used for breaking the traditional bounds of mobility, market access, and customer outreach. Such innovations usually consist of merging social media messaging, online catalogues, and digital payments; thus, small-scale entrepreneurs can keep on developing and even expanding their businesses (Räisänen & Tuovinen, 2020). The literature under this theme refers to social media and digital marketing as extraordinarily strong allies for the purpose of small, local, and home-based enterprises. However, the adoption and its subsequent effect are influenced by the factors of digital literacy, infrastructure, and socioeconomics.

3.2 E-commerce, Digital Inclusion, and Rural / MSME Growth

The literature on rural and small businesses, apart from social media marketing, includes a significant aspect of the use of e-commerce platforms. Research conducted on rural MSMEs (micro, small, and medium enterprises) indicates that e-commerce, along with fintech solutions in some instances, can result in better market access, an increase in revenue, and more participation in the digital economy. Nevertheless, the authors highlight and mention bad points with digital infrastructure, low digital literacy, logistic bottlenecks, and cultural resistance to adoption as the major hurdles (Ahmed & Sur, 2023).

In the same way, studies investigate e-commerce for rural micro-entrepreneurs in the Global South, where even though digital marketplaces are very promising for rural entrepreneurship, many structural and information asymmetry problems, like lack of trust, poor support systems, logistics challenges, and knowledge gaps, stand in the way of their proper usage. This research recommends context-sensitive approaches to truly include and sustain rural sellers on the platforms (Bhatia-Kalluri, 2021).

Evidence from different resources strongly supports the view that rural SMEs adopting e-commerce and digital innovations have better economic outcomes. For example, a research paper that analyzed the situation of rural SMEs reported that the use of e-commerce technology had a positive impact on the economic performance of the SMEs (profits, market expansion), thus inferring that, given the right conditions, digital adoption can lead to innovation and growth simultaneously in the rural enterprises (Zhang et al., 2023). The literature on e-commerce keeps coming up with the same conclusion: e-commerce has the potential to provide scalability, access to new markets, and a sustainable growth trajectory for rural and small businesses, but the realization of such benefits is dependent on the presence of conducive environments (in infrastructure, digital literacy, logistics support, trust building, and capacity strengthening).

3.3 Challenges, Constraints, and the Need for Contextual Support

Not every study presents a completely positive picture. Quite a few research works indicate that there are major limitations related to the structure, socioeconomics, and context that create barriers for rural businessmen to get the fullest benefit from the use of digital marketing and e-commerce. Besides these factors, limited digital literacy, poor internet connectivity, lack of access to capital (finance, packing, and transport), as well as socio-cultural barriers (particularly for women or underprivileged groups) have been identified as the main obstacles in the study (Grimes, 2003). One of the reviews points out the danger of unequal advantages: in that some of the entrepreneurs might be able to use the digital devices effectively and get more profit, while many others will still be left behind as they have neither the ability nor the resources, and that will cause the inequality of digital inclusion even in rural areas (Goel, 2024).

In situations where the conventional supply chains have been disrupted, or the platforms have been set up in such a way that only the more skilled sellers can prosper, small manufacturers or startups may not be able to win the competition. Not without the proper Institutional backing, like training, logistics infrastructure, or community nurturing, digital alone might not lead to the sustainable growth that everybody is looking for. Several writers have been advocating mixed approaches, i.e., combining traditional community-based marketing with digital integration, instead of regarding digital marketing/e-commerce as the only solution (Haris, 2024). Gender-focused research has singled out additional layers of complexity. Apart from the infrastructural and digital challenges, socio-cultural norms, lack of access to credit or mobility, and gendered constraints on technology use can limit rural women entrepreneurs' potential gains from digital platforms.

4. Research Gap

Digital transformation of Indian firms has been a subject of several studies, but the research on digital sustainable marketing and its impact on the growth of rural entrepreneurs in Jharkhand is lacking. The existing literature has been centered around urban digital markets, issues related to digital literacy, and overall digitalization of MSMEs in India, but has not explored the positive aspects of social media marketing and e-commerce platforms in terms of sustainability, scalability, and competitiveness of rural enterprises. Most of the studies conducted consider digital adoption as a technological transformation rather than looking at its strategic marketing value, which includes customer engagement, brand building, market expansion, and eco-friendly digital practices. Thereby, a huge gap exists in the understanding of the overall effect of digital sustainable marketing on the performance of the venture in rural areas like Jharkhand, which have not been given their due share of representation.

Also, only a minuscule number of empirical investigations have unearthed the real-world hurdles, such as limited infrastructure, inadequate digital skills, lack of access to platforms, and mistrust from consumers that rural businesses must deal with before they can finally implement digital sustainable marketing. The case of different digital tools, like Instagram, WhatsApp Business, and Facebook

Marketplace, along with e-commerce platforms, has not yet been resolved in terms of their individual or collective impact on the growth paths of rural entrepreneurs; there is no literature on this. Consequently, this lack of empirical research based on a specific focus results in a gap in knowledge regarding the digital practices that are most effective and sustainable for rural enterprises. Hence, researching Jharkhand rural entrepreneurs is a great opportunity to build evidence on how and to what extent digital sustainable marketing can help business scalability and market outreach.

5. Objectives of the Study

- To assess how social media marketing practices influence the scaling and growth of rural entrepreneurs in Jharkhand.
- To examine the impact of e-commerce adoption on market expansion and business sustainability among rural enterprises.
- To evaluate the role of digital infrastructure and access in shaping the digital marketing effectiveness and scaling opportunities for rural micro-entrepreneurs.
- To identify how sustainable digital marketing practices contribute to improving long-term business resilience and sustainable development outcomes for rural entrepreneurs.

6. Hypotheses of the Study

H1: Social media marketing practices have a significant effect on the scaling and growth of rural entrepreneurs in Jharkhand.

H2: E-commerce adoption significantly influences market expansion and business sustainability among rural enterprises.

H3: Digital infrastructure and access have a significant effect on the digital marketing effectiveness of rural micro-entrepreneurs.

H4: Sustainable digital marketing practices significantly contribute to long-term business resilience and sustainable development outcomes for rural entrepreneurs.

7. Research Methodology

The current research has been conducted in Jharkhand, a state synonymous with its burgeoning rural entrepreneurial ecosystem, powered by handicrafts, agro-based enterprises, small-scale manufacturing, and traditional skills. Jharkhand's multifaceted socio-economic scenario, the different levels of digital access among the population, and the growing trend of the rural populace participating in online marketplaces make it a perfect setting to investigate the contribution of digital sustainable marketing, particularly via social media and e-commerce, to the growth and scalability of rural entrepreneurs. The study intends to focus on rural entrepreneurs in the selected districts of Jharkhand who are either already using or are willing to start using digital marketing tools to promote their business as the target group. The participants will be of different age groups, educational backgrounds, income categories, and entrepreneurial experience, which will provide a complete picture of the digital adoption and sustainable market practices. Using Cochran's formula, a sample size of 130 respondents is considered sufficient not only to achieve statistical relevance but also to capture the variations in user behavior, adoption, and entrepreneurial growth in terms of digitization.

This study investigates how digital sustainable marketing methods affect the growth and performance of rural businesses. It uses a quantitative explanatory approach to understand these connections. Entrepreneurial growth can be measured through this method by finding patterns, testing ideas, and looking at how things like social media use, online shopping activities, digital skills, and sustainable marketing strategies impact business success. Data is collected using a structured questionnaire with a five-point Likert scale, asking people about their opinions, feelings, challenges, and how involved they are with digital media. The survey covers topics like how social media affects brand recognition and customer loyalty, how online marketplaces help reach new customers, and how sustainable technologies have helped businesses grow over time. Participants are chosen using a mix of stratified, purposeful, and convenient sampling methods. This helps ensure the sample includes people from different areas, business types, and stages of business development. It also makes it easier to reach those who are active in using digital tools.

Microsoft Excel and the Statistical Package for the Social Sciences (SPSS) are used to manage and analyze the collected data. SPSS has become the go-to tool for advanced statistical analysis, while Excel is used for data screening, coding, and initial data tabulation. The study provides descriptive statistics like frequency, mean, and standard deviation to summarize the overall use of digital technology and marketing behaviors among rural entrepreneurs. To evaluate theories, inferential statistical methods such as correlation and regression, along with analysis of variance (ANOVA), chi-square, and t-tests, are used to examine the strength of relationships. These analytical tools help in understanding how digital sustainable marketing influences market penetration, consumer engagement, revenue generation, and long-term scalability. The study's structured methodology highlights the potential of social media and e-commerce as tools for evaluating the success of rural entrepreneurs in Jharkhand.

8. Result

8.1 Result Based on Demographics

"Table 1: Descriptive Statistics"

	"N"	"Minimum"	"Maximum"	"Mean"	"Std. Deviation"
"Gender"	130	1	2	1.50	.502
"Age Group"	130	1	4	2.52	1.087
"Educational Qualification"	130	1	4	2.44	1.071
"Type of Enterprise"	130	1	4	2.64	1.071
"Years of Entrepreneurship Experience"	130	1	4	2.55	1.100
"Monthly Income from Business"	130	1	4	2.53	1.142
"Digital Platforms Used"	130	1	4	2.51	1.087
Valid N (listwise)	130				

"The descriptive data show that the 130 people surveyed are spread out evenly when it comes to their background and business-related traits. There is an equal split between men and women, with an average score of 1.5 for gender participation. Most of the respondents are in the middle age group, as shown by an average age group score of 2.52. They also have a good level of education, with an average score of 2.44, meaning most have finished high school or have a college degree. Many of them have moderate experience in running a business and work for small or medium-sized companies, as indicated by average scores of 2.54

for years of experience and 2.55 for the type of business. When compared to the typical earnings of entrepreneurs in rural or semi-urban areas, their average monthly income of 2.53 suggests they are in the middle-income range. Additionally, with an average score of 2.51 for digital tools used, they use digital platforms in a moderate way. Overall, the sample is well balanced in terms of education, income, experience, and use of digital tools, and it is quite a diverse group."

"Table 2: Demographic Statistics"

		"Frequency"	"Percent"	"Valid Percent"	"Cumulative Percent"
"Gender"	Male	65	50.0	50.0	50.0
	Female	65	50.0	50.0	100.0
	Total	130	100.0	100.0	
"Age Group"	18–25 years	30	23.1	23.1	23.1
	26–35 years	33	25.4	25.4	48.5
	36–45 years	37	28.5	28.5	76.9
	46+ years	30	23.1	23.1	100.0
	Total	130	100.0	100.0	
"Educational Qualification"	No formal education	30	23.1	23.1	23.1
	School level	41	31.5	31.5	54.6
	Graduate	31	23.8	23.8	78.5
	Postgraduate	28	21.5	21.5	100.0
	Total	130	100.0	100.0	
"Type of Enterprise"	Handicraft	25	19.2	19.2	19.2
	Agro-based	31	23.8	23.8	43.1
	Food Processing	40	30.8	30.8	73.8
	Retail	34	26.2	26.2	100.0
	Total	130	100.0	100.0	
"Years of Entrepreneurship Experience"	Less than 1 year	28	21.5	21.5	21.5
	1–3 years	36	27.7	27.7	49.2
	4–6 years	32	24.6	24.6	73.8
	7+ years	34	26.2	26.2	100.0
	Total	130	100.0	100.0	
"Monthly Income from Business"	10,001–30,000	35	26.9	26.9	26.9
	30,001–50,000	24	18.5	18.5	45.4

	50,001–1,00,000	38	29.2	29.2	74.6
	Above ₹1,00,000	33	25.4	25.4	100.0
	Total	130	100.0	100.0	
"Digital Platforms Used"	Facebook	30	23.1	23.1	23.1
	Instagram	34	26.2	26.2	49.2
	WhatsApp Business	36	27.7	27.7	76.9
	Amazon/Flipkart/Meesho	30	23.1	23.1	100.0
	Total	130	100.0	100.0	

"The demographic statistics reveal a sample of 130 respondents that is highly representative and well-balanced with respect to the major categories. Gender selection among the participants is unbiased, as it consists of 50% male and 50% female. Age distributions suggest a variety of ages present, with the largest portion (28.5%) falling under the middle-aged range, and then the remaining age groups are equally divided. Education level has similar diversity, where the largest share of respondents completed higher secondary or undergraduate education (31.5%), and the rest are equally scattered across different levels. Types of businesses run by the respondents differ; however, medium-sized enterprises (30.8%) are slightly more than small and micro enterprises. The distribution of respondents by entrepreneurial experience shows that they are scattered all over the spectrum of experience, with the majority group (27.7%) being of moderate experience. Income level distribution indicates that the largest portion is in the middle-income category, as 29.2% generate average income from their activities, while the rest are unevenly split between low and high-income categories. Digital platform use shows an even spread among respondents, with the largest segment (27.7%) having a moderate level of digital platform use, hence indicating more businesses are adopting digital tools for their operations. To sum it up, the demographic characteristics point to a sample that is diverse and representative enough for analysis that has been done or will be done."

8.2 Based on the Hypothesis

H1: Social media marketing practices have a significant effect on the scaling and growth of rural entrepreneurs in Jharkhand.

"Table 3: Model Summary"

"Model"	"R"	"R Square"	"Adjusted R Square"	"Std. Error of the Estimate"	"Change Statistics"				
					"R Square Change"	"F Change"	"df1"	"df2"	"Sig. F Change"
1	.208[a]	.043	.036	.53790	.043	5.798	1	128	.017
a. Predictors: (Constant), Social Media Marketing Practices									

"A small but important effect of social media marketing on the outcome variable is shown in the model summary. The R-squared value is 0.043, and the R value is 0.208, meaning that social media marketing practices explain only 4.3% of the changes in the outcome variable. This shows a weak but positive connection between the variables. Even when considering the sample size, the model's ability to explain the data is still limited, as seen in the corrected R-squared of 0.036. The standard error of estimation is 0.53790, which indicates a high level of prediction error. Although the effect size is small, the model is statistically significant with an F-change value of 5.798 and a significance level of 0.017 ($p < 0.05$)." In simple words, there is a statistically significant link between the two variables, but social media marketing does not explain much of the variation in the outcome variable.

"Table 4: ANOVA[a]"

"Model"		"Sum of Squares"	"df"	"Mean Square"	"F"	"Sig."
1	Regression	1.678	1	1.678	5.798	.017[b]
	Residual	37.034	128	.289		
	Total	38.712	129			

a. "Dependent Variable: Scaling and Growth of Rural Entrepreneurs."

b. "Predictors: (Constant), Social Media Marketing Practices."

"This regression model assesses the role of social media marketing by rural entrepreneurs and its impact on their business growth. According to the ANOVA table, the regression sum of squares, which is 1.678, only accounts for a tiny fraction of the total variation, 38.712, as compared to the residual sum of squares, which is 37.034. The F-value is 5.798, and the p-value is 0.017 ($p < 0.05$), which means that social media marketing has a mild but noticeable impact on the main outcome. This points to the fact that social media is a predictor of business growth to some extent; however, the total effect is minor, and the outcome is likely to be shaped by a host of other factors excluded from the model."

"Table 5: Coefficients[a]"

"Model"		"Unstandardized Coefficients"		"Standardized Coefficients"	"t"	"Sig."	"95.0% Confidence Interval for B"	
		"B"	"Std. Error"	"Beta"			"Lower Bound"	"Upper Bound"
1	(Constant)	3.603	.276		13.045	.000	3.057	4.150
	Social Media Marketing Practices	-.220	.091	-.208	-2.408	.017	-.401	-.039

a. Dependent Variable: Scaling and Growth of Rural Entrepreneurs

"The coefficients are depicted in the table, which indicates that rural entrepreneurs can attain noticeable growth statistically through the application of social media marketing, but remarkably, this specific tactic takes the opposite path regarding scaling up, making it harder for the entrepreneurs. If the situation remains unchanged, then the unstandardized coefficient shows the scaling along with the growth score dropping by a value of 0.220 points for each one-point growth in the social media marketing factor (B = -0.220). The

standardized beta (-0.208) additionally indicates a small negative correlation. This impact is seen as statistically significant at the 5% level, as noted in the t-value (-2.408) and p-value (0.017). The confidence interval for B (-0.401 to -0.039) is in support of this, as it does not encompass the figure zero." It is noteworthy that, although social media was presumed to be a growth facilitator, the negative coefficient indicates that the rural entrepreneurs' current social media marketing utilization may not be adequate, may not be focused properly, or that there is not an effective reach to the intended audience; thus, the result is little or no growth. Excluding social media marketing, the constant figure (3.603) represents the least level of growth. These findings imply that further studies could be necessary to grasp this crucial and paradoxical finding correctly.

H2: E-commerce adoption significantly influences market expansion and business sustainability among rural enterprises.

"Table 6: Model Summary"

"Model"	"R"	"R Square"	"Adjusted R Square"	"Std. Error of the Estimate"	"Change Statistics"				
					"R Square Change"	"F Change"	"df1"	"df2"	"Sig. F Change"
1	.204[a]	.042	.034	.65246	.042	5.555	1	128	.020

a. Predictors: (Constant), "E-commerce Adoption."

"Adoption of e-commerce has a minor yet significant influence on the dependent variable as evidenced by the model summary. The value of the correlation coefficient, R, is 0.204, indicating a weak positive connection. Nonetheless, the R-squared of 0.042 states that the adoption of e-commerce is only responsible for approximately 4.2% of the changes in the variable of interest. The adjusted R-squared of 0.034, even considering the sample size, indicates that the model has a reduced capability to account for the outcome. The standard error of estimate is 0.65246, which suggests a moderate prediction error. A p-value of 0.020 and an F-change value of 5.555 imply that the model is statistically significant, hence e-commerce adoption is a major variable in forecasting the dependent variable." To sum up, the model demonstrates that e-commerce adoption positively and significantly influences the outcome, but the effect is not extraordinarily strong. This indicates that there are other factors that participate in affecting the dependent variable as well.

"Table 7: ANOVA[a]"

"Model"		"Sum of Squares"	"df"	"Mean Square"	"F"	"Sig."
1	Regression	2.365	1	2.365	5.555	.020[b]
	Residual	54.491	128	.426		
	Total	56.856	129			

a. Dependent Variable: Market Expansion & Business Sustainability

b. Predictors: (Constant), E-commerce Adoption

"There is a clear statistical connection between using e-commerce and both growing the market and making the company more sustainable, as shown in the ANOVA table. Even though e-commerce use explains a big part of the overall change (56.856), it is only partly explained by the regression sum of squares (2.365), not by the residual sum of squares (54.491). With a p-value of 0.020 (which is below 0.05) and an F-value of 5.555, the predictor variable is considered statistically significant in the model. Like other important factors,

this shows that e-commerce adoption still has a meaningful effect on market growth and business sustainability, even though the overall impact is not exceptionally large."

"Table 8: Coefficients[a]"

"Model"		"Unstandardized Coefficients"		"Standardized Coefficients"	"t"	"Sig."	"95.0% Confidence Interval for B"	
		"B"	"Std. Error"	"Beta"			"Lower Bound"	"Upper Bound"
1	(Constant)	2.686	.278		9.658	.000	2.135	3.236
	E-commerce Adoption	.211	.090	.204	2.357	.020	.034	.389
a. Dependent Variable: Market Expansion & Business Sustainability								

"The coefficient table presents the statistical data confirming that the use of e-commerce has a significant and positive impact on the expansion of the market and the sustainability of the business. If nothing changes, the unstandardized coefficient (B = 0.211) states that a 1-unit rise in e-commerce adoption leads to a 0.211-unit rise in the combined score for market and business sustainability. The standard beta value of 0.204 indicates a small but positive relationship. The t-value (2.357) and p-value (0.020) reveal that the effect is statistically significant at the 5% level. Another indicator of the significance of this connection is the 95% confidence interval for B, which is (0.034 to 0.389) and does not cover zero. If e-commerce is not used, the scores for market expansion and business sustainability would stay unchanged at 2.686 levels. The results, although not large, recommend that new businesses can still benefit from the application of e-commerce tools and methods in the areas of market growth and sustainability improvement."

H3: Digital infrastructure and access have a significant effect on the digital marketing effectiveness of rural micro-entrepreneurs.

"Table 9: Model Summary"

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate	"Change Statistics"				
					"R Square Change"	"F Change"	"df1"	"df2"	"Sig. F Change"
1	.180[a]	.032	.025	.70931	.032	4.271	1	128	.041
a. Predictors: (Constant), Digital Infrastructure and Access									

"The aspect of the dependent variable that the model summary clears up is the Digital Infrastructure and Access, which are the factors, and their influence is slight and statistically insignificant. The R-squared value of 0.032 and the R-value of 0.180 indicate that these factors account for only a small percentage, 3.2%, of the changes in the outcome variable. This suggests a very weak positive association. The sample size leads to the adjusted R-squared value of 0.025, which means these predictors barely explain the outcome. The standard error of estimate of 0.70931 indicates that the prediction errors are spread out. Despite being small, the effect is still statistically significant, and this is indicated by the F-change value of 4.271 along with a significant level of 0.041 ($p < 0.05$). Digital Infrastructure and Access are, therefore, considered contributors to the

model; they do not completely account for the dependent variable. The model does illustrate how infrastructure and access impact the result, but it does not cover the numerous other important factors that also play a role in the contributions."

"Table 10: ANOVA[a]"

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.149	1	2.149	4.271	.041[b]
	Residual	64.400	128	.503		
	Total	66.549	129			

a. "Dependent Variable: Digital Marketing Effectiveness."

b. "Predictors: (Constant), Digital Infrastructure and Access."

"Although the model is not particularly good at explaining the data, the ANOVA table shows that the regression model looking at how Digital Infrastructure and Access affect Digital Marketing Effectiveness is statistically significant. When we compare the regression sum of squares (2.149) to the residual sum of squares (64.400), it shows that these factors only explain a small part of the total variance (66.549). The F-value of 4.271, with a significance level of 0.041 ($p < 0.05$), proves that Digital Infrastructure and Access are strong predictors of Digital Marketing Effectiveness. However, their influence seems limited because the regression sum of squares is quite small. So, even though having access to digital infrastructure does help with digital marketing effectiveness, the model does not explain much of the variation. Because of this, the model has a low effect size but is still statistically valid."

"Table 11: Coefficients[a]"

Model		"Unstandardized Coefficients"		"Standardized Coefficients"	"t"	"Sig."	"95.0% Confidence Interval for B"	
		"B"	"Std. Error"	"Beta"			"Lower Bound"	"Upper Bound"
1	(Constant)	3.647	.280		13.030	.000	3.093	4.200
	Digital Infrastructure and Access	-.187	.090	-.180	-2.067	.041	-.366	-.008

a. Dependent Variable: Digital Marketing Effectiveness

"According to the table of coefficients, there is a strong negative connection between digital infrastructure and access, as well as the effectiveness of digital marketing. The statistical findings, such as a t-value of -2.067 and a p-value of 0.041, support the idea that digital marketing is not as effective, due to this weak negative link between infrastructure and access (B = -0.187) and a standardized beta of -0.180. This conclusion is also confirmed by the 95% confidence interval, which ranges from -0.366 to -0.008. There are several explanations for this unexpected negative relationship, including a lack of digital skills, poor use of available infrastructure, and unreliable internet, which create a situation where there is good infrastructure but poor results in marketing. When there is no digital infrastructure, the base level of effectiveness remains at 3.647. Further research is needed to fully understand the model's indication of a strong but negative relationship."

H4: Sustainable digital marketing practices significantly contribute to long-term business resilience and sustainable development outcomes for rural entrepreneurs.

"Table 12: Model Summary"									
"Model"	"R"	"R Square"	"Adjusted R Square"	"Std. Error of the Estimate"	"Change Statistics"				
					"R Square Change"	"F Change"	"df1"	"df2"	"Sig. F Change"
1	.246[a]	.060	.053	.76308	.060	8.234	1	128	.005
a. Predictors: (Constant), Sustainable Digital Marketing Practices									

"According to the table of coefficients, there is a strong negative connection between digital infrastructure and access, as well as the effectiveness of digital marketing. The statistical findings, such as a t-value of -2.067 and a p-value of 0.041, support the idea that digital marketing is not as effective, due to this weak negative link between infrastructure and access (B = -0.187) and a standardized beta of -0.180. This conclusion is also confirmed by the 95% confidence interval, which ranges from -0.366 to -0.008. There are several explanations for this unexpected negative relationship, including a lack of digital skills, poor use of available infrastructure, and unreliable internet, which create a situation where there is good infrastructure but poor results in marketing. When there is no digital infrastructure, the base level of effectiveness remains at 3.647. Further research is needed to fully understand the model's indication of a strong but negative relationship."

"Table 13: ANOVA[a]"						
"Model"		"Sum of Squares"	"df"	"Mean Square"	"F"	"Sig."
1	Regression	4.794	1	4.794	8.234	.005[b]
	Residual	74.533	128	.582		
	Total	79.327	129			
"a. Dependent Variable: Business Resilience & Sustainable Development Outcomes."						
b. "Predictors: (Constant), Sustainable Digital Marketing Practices."						

"A study used a statistically significant regression model to examine how sustainable digital marketing practices affect company resilience and sustainable development, as seen in the analysis of variance table. These practices account for a small but meaningful portion of the overall variation. The regression variance is 4.794, while the residual variance is 74.533, meaning the total variation is 79.327. The F-value of 8.234 and a p-value of 0.005 ($p < 0.01$) show that the predictor variable has a significant effect on the outcome. The model's significance highlights the importance of using sustainable digital technologies for building company resilience and supporting long-term entrepreneur development, even though the overall impact is not exceptionally large."

"Table 14: Coefficients[a]"								
Model		'Unstandardized Coefficients"		"Standardized Coefficients"	"t"	"Sig."	"95.0% Confidence Interval for B"	
		"B"	"Std. Error"	"Beta"			"Lower Bound"	"Upper Bound"
1	"(Constant)"	2.328	.322		7.241	.000	1.692	2.965
	"Sustainable Digital Marketing Practices"	.296	.103	.246	2.869	.005	.092	.501
a. "Dependent Variable: Business Resilience & Sustainable Development Outcomes."								

"Sustainable digital marketing practices have a clear and positive effect on a company's ability to stay strong and develop sustainably, as shown in the table of coefficients. If everything else stays the same, the unstandardized coefficient (B = 0.296) shows that for each increase of one unit in the use of digital marketing, there is a corresponding increase of 0.296 units in the score for resilience and sustainable development. This indicates a small to moderate positive effect, as shown by the standardized beta (0.246). The result is statistically significant, with a t-value of 2.869 and a p-value of 0.005. The reliability of this coefficient is also confirmed by the 95% confidence interval (0.092 to 0.501), which does not include zero. The constant value of 2.328 represents the level of business resilience that would exist without any digital marketing efforts. These findings show that companies can gain long-term benefits for resilience and sustainable development by using new digital marketing strategies. The impact is clear."

9. Discussion

The current research brings to the forefront the digital sustainable marketing practices, social media marketing, e-commerce uptake, digital infrastructure access, and sustainability-centric digital strategies that influence the development paths of rural businesspeople in Jharkhand, most importantly. The results indicate the opening of new economic possibilities for micro and small businesses due to digital platforms; however, the actual effect does not only vary from one factor to another but also indicates a complex and non-linear process of digital integration.

Social media marketing, even though it is considered a powerful tool for visibility and engagement and plays a major role in the integration of technology into organizations, has a negative impact, and the extent of rural entrepreneurs' scaling and growth is moderate. This contrasts with the prevailing literature that supporters of social media being a driver for SME growth in developing countries (Chatterjee et al., 2021) have. The negative coefficient infers that entrepreneurs may be using social media in an ad hoc manner, without having proper targeting, or upping the quality of content that is not in line with consumer expectations. This parallels the views of Goel (2024), who posits that the digital literacy gaps and lack of training hinder rural entrepreneurs from converting online visibility into actual sales performance.

The adoption of e-commerce is the factor that leads to market expansion and business sustainability, through positive and significant interaction. The validation of this finding is done through the studies of Basak (2024) and Zhang et al. (2023), who mention that the proper e-commerce frameworks make the traditional entry barriers lower and allow small manufacturers to reach wider digital markets. It is the rural entrepreneurs in Jharkhand who especially benefit from the e-commerce platforms such as Amazon Karigar and Flipkart Samarth, which not only provide them with the necessary logistics, marketing, and packaging

support but also the very critical elements of scaling the micro-enterprises that have been operating within localized markets only.

The study reveals the existence of a negative yet significant relationship between digital infrastructure/access and digital marketing effectiveness. Even though the infrastructure in rural India is gradually getting better, the entrepreneurs are still restricted by the problems of uneven connectivity, unstable networks, and inconsistent access to digital devices. This situation is in line with the argument of Grimes (2003) that digital access by itself does not ensure positive outcomes unless it is coupled with contextualized training and technological support. The negative coefficient also implies that infrastructure being up only will not necessarily lead to accommodating the digital readiness of the entrepreneur, but may, in fact, even frustrate or hinder them.

The most important digital marketing practice aimed at sustainability, revealed through studies, would be the strongest and most positive one, as well as significantly impacting the respective business resilience and development outcomes overall. This is in line with the global literature that points out the fact that digital sustainability, like the abovementioned practices, among others, will be the cause of UNCTAD (2021; Hernández et al., 2024) long-term stability. Rural entrepreneurs adopting eco-friendly digital strategies will find themselves in a better position compared to their competitors, particularly in markets where consumers are increasingly putting weight on aspects such as authenticity, local identity, and narratives around sustainability.

The debate illustrates that digital sustainable marketing can be a powerful force, but its positive impacts will be contingent on factors such as the context, the level of skill development, the support provided by the platforms, and the integration with sustainable business practices. The variety of the results brings into focus the necessity of targeted schooling, raising the level of digital literacy, and policy interventions that are specially tailored to Jharkhand's unique socio-cultural scenario.

10. Conclusion

According to the findings of the research, digital sustainable marketing is especially important for the growth and resilience of rural entrepreneurs in Jharkhand, but its impact is not the same everywhere. Digital marketing has opened new avenues for entrepreneurs, and so digital marketing can have a positive impact on rural business only if the digital literacy level is high enough, the platforms are integrated well, and support is being given to the businesses contextually. Social media marketing, even though it is relevant globally, does not have much to do with growth in the Jharkhand context. The main reasons for that are limited strategic usage, inconsistent content practices, and inadequate digital skills. This finding suggests that while orientation and build-up are necessary, the focus should be on effective utilization as well.

E-commerce turns out to be a more trustworthy market growth and progress driver. Organized platforms equip micro-entrepreneurs with the logistics, payment, and packaging, plus visibility support that they could not manage by themselves. Therefore, e-commerce has a great role to play in the market reach and business stability in rural areas. On the other hand, the negative effect of digital infrastructure access on marketing effectiveness indicates that structural issues, such as poor networks, limited devices, and a lack of operational knowledge, persist and need to be solved through targeted interventions.

Sustainable digital marketing practices are the strongest positive predictors of long-term business resilience. Entrepreneurs implementing green digital strategies, highlighting local character, and practicing ethical online branding reap better conciliatory results. This indicates the growing importance of sustainability as an economic advantage and a guiding business philosophy. The research implies that a holistic approach is required, which includes the provision of digital training, strengthening of infrastructure, platform support, and sustainability-oriented marketing. It is essential that policymakers, NGOs, and digital

platform providers cooperate to create an inclusive digital ecosystem in Jharkhand, which will empower rural entrepreneurs to not only survive but also thrive in a digital economy that is increasingly dominated by technology.

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