



## The Influence of Digital Advertising, SEO, and Social Media Interaction on Fresh Fish Sales: A Study on Fisheries Agribusiness Startups in East Java

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### Abstract

Digital transformation has changed business operations in various sectors, including fisheries agribusiness, where fisheries startups in East Java utilize digital advertising, SEO, and social media interaction to increase fresh fish sales. This study used a quantitative design with 120 respondents through a Likert scale questionnaire. Multiple regression analysis shows that all three factors have a positive and significant effect on sales performance, with social media interaction being the most dominant. Digital advertising increases awareness and purchase intention through targeted and cost-effective campaigns, SEO strengthens online credibility and visibility, while social media interaction builds consumer trust, engagement, and loyalty. An integrated strategy of all three enables resource optimization, risk mitigation, and short-term sales growth and long-term market resilience. Research limitations include a focus on small-scale startups in East Java, so generalizations need to be made cautiously. Future research should explore more personalized digital strategies, integration of additional platforms, and utilization of advanced data analytics.

**Keywords:** *Digital Transformation, Digital Advertising, SEO, Social Media Interaction, Sales Performance.*

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### 1. Introduction

Digital transformation has significantly reshaped business operations across industries, including agribusiness. The fisheries sector, traditionally reliant on conventional markets, is now shifting toward online platforms as digital advertising offers cost-efficient methods to expand product reach, customize campaigns, and evaluate effectiveness in real time [1]. Search Engine Optimization (SEO) further strengthens online visibility by enabling higher search rankings and attracting potential customers organically, which increases consumer awareness of fresh fish products and improves sustainable online sales [2]. At the same time, social media platforms such as Instagram, Facebook, and TikTok provide opportunities for fisheries startups to engage directly with consumers, showcase product quality, and build emotional connections, which have been shown to foster trust, loyalty, and purchase intentions [3].

In Indonesia, digital adoption rates are among the highest in Southeast Asia, with East Java emerging as a hub for fisheries startups due to its marine resources and growing e-commerce ecosystem. Digital marketing strategies have been proven to enhance the competitiveness of SMEs, especially in food-related sectors [4]. The COVID-19 pandemic further accelerated this transition, as digital platforms became the main channels for promotion and sales, and consumers increasingly favored online purchasing for convenience, safety, and product variety [5]. However, significant challenges remain, including limited digital literacy, inadequate infrastructure, and financial constraints that reduce the effectiveness of digital marketing campaigns [6]. These conditions highlight the need for context-specific studies that link theory and practice in fisheries digitalization [7].

This study aims to analyze the influence of digital advertising, SEO, and social media interaction on fresh fish sales in East Java fisheries startups. By examining the combined impact of these three elements, it seeks to provide empirical evidence on the effectiveness of digital marketing tools in the agribusiness sector while offering practical recommendations to improve competitiveness in a digital economy [8]. This is particularly relevant as Indonesia's fisheries sector, while contributing significantly to the national economy, has long been constrained by conventional distribution systems that limit expansion and price competitiveness [9]. Growing consumer digital literacy further underscores the urgency for startups to adopt integrated digital marketing approaches that combine visibility, interactivity, and trust-building [10].

Beyond consumer engagement, digital marketing also generates valuable analytics for strategy refinement. Startups can utilize engagement data to personalize campaigns and adapt to dynamic markets [11]. Globally, fisheries products are increasingly marketed via e-commerce supported by digital traceability systems, which enhance food safety assurance and consumer confidence [12]. Therefore, this research contributes to both local and global discourse by situating East Java fisheries within broader digital economy transformations. Its novelty lies in integrating advertising, SEO, and social media into a unified framework, examining their simultaneous effect on perishable products. By focusing on small fisheries startups with limited resources, the study highlights social media's unique role in building trust and loyalty [13]. In sum, the research not only enriches academic perspectives but also provides actionable insights for entrepreneurs and policymakers to strengthen sustainable digital strategies in Indonesian fisheries.

## **2. Methods**

### **2.1 Research Design**

This study employs a quantitative research design aimed at analyzing the influence of digital advertising, search engine optimization (SEO), and social media interaction on the sales performance of fisheries agribusiness startups in East Java. The quantitative approach was chosen because it enables measurable data collection and statistical testing for hypothesis verification.

### **2.2 Population and Sample**

The population of this study consists of fisheries startups in East Java that have adopted digital marketing strategies. To obtain relevant data, purposive sampling was applied, targeting startups that actively utilize digital advertising, search engine optimization (SEO), and social media platforms in their marketing activities. A total of 120 respondents, consisting of startup owners and digital marketing managers, participated in the survey. This sampling approach ensured that only businesses with direct experience in digital marketing practices were included, thereby increasing the validity of the findings.

### **2.3 Data Collection**

Primary data were collected through a structured questionnaire containing closed-ended questions measured on a five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). The questionnaire was divided into four sections covering digital advertising, SEO, social media interaction, and sales performance. Items were developed and adapted from validated indicators in previous studies to ensure content relevance. The survey was distributed electronically to reach respondents efficiently and minimize geographical constraints.

### **2.4 Reliability and Validity Testing**

To ensure measurement accuracy, reliability, and validity, tests were conducted using SPSS. Cronbach's Alpha was employed to test internal consistency, where values above 0.70 were considered acceptable [14].

Construct validity was examined through Pearson's correlation between each indicator and its corresponding variable. Indicators with significant positive correlations ( $p < 0.05$ ) were deemed valid. This process ensured that the questionnaire items accurately measured the intended constructs of digital advertising, SEO, social media interaction, and sales performance.

### **2.5 Data Analysis Technique**

Data were analyzed using descriptive and inferential statistics in SPSS. Descriptive statistics, including means, standard deviations, and frequency distributions, were used to summarize respondent characteristics and general patterns of digital marketing adoption. For hypothesis testing, multiple regression analysis was applied to assess the effects of the independent variables—digital advertising (X1), SEO (X2), and social media interaction (X3)—on the dependent variable, sales performance (Y). Regression coefficients,  $R^2$  values, and significance levels (p-values) were examined to determine the strength and direction of relationships. This method was selected because it enables simultaneous testing of multiple predictors and their combined effect on the outcome variable.

### **2.6 Operationalization of Variables**

The operationalization of variables is carried out to explain the indicators used in measuring the research variables. The variables studied include Digital Advertising (X1), Search Engine Optimization (SEO) (X2), Social Media Interaction (X3), and Sales Performance (Y). The operationalization of variables is presented in Table 1 below:

**Table 1.** Variables, Indicators, and Hypotheses

Variable	Indicators	Hypothesis
Digital Advertising (X1)	- Frequency of online ads - Attractiveness of ad design - Clarity of product information - Relevance of ad content	H1: Digital advertising has a positive and significant effect on fresh fish sales.
Search Engine Optimization (SEO) (X2)	- Keyword optimization - Website ranking in search engines - Content quality and relevance - Ease of navigation	H2: SEO has a positive and significant effect on fresh fish sales.
Social Media Interaction (X3)	- Responsiveness to consumer inquiries - Customer engagement (likes, shares, comments) - Trust from customer feedback - Use of social media features (stories, reels, groups)	H3: Social media interaction has a positive and significant effect on fresh fish sales.
Sales Performance (Y)	- Number of transactions - Sales growth rate - Customer retention rate - Profitability level	H4: Digital advertising, SEO, and social media interaction simultaneously have a positive and significant effect on fresh fish sales.

Based on these variables and indicators, four research hypotheses were formulated. The first three hypotheses test the effects of individual independent variables (digital advertising, SEO, and social media interaction) on fresh fish sales, while the fourth hypothesis examines their simultaneous influence. By applying regression analysis using SPSS, this study aims to determine the extent to which these digital marketing factors contribute to improving sales performance in fisheries startups in East Java.

### 3. Results and Discussion

#### 3.1 Results

##### 3.1.1. Research Model

The research model is designed to illustrate the directional relationship between the independent and dependent variables. As shown in Figure 3.1, Digital Advertising (X1), Search Engine Optimization (X2), and Social Media Interaction (X3) are positioned as factors influencing Sales Performance (Y).

This model serves as the conceptual framework and the basis for hypothesis testing in this study.

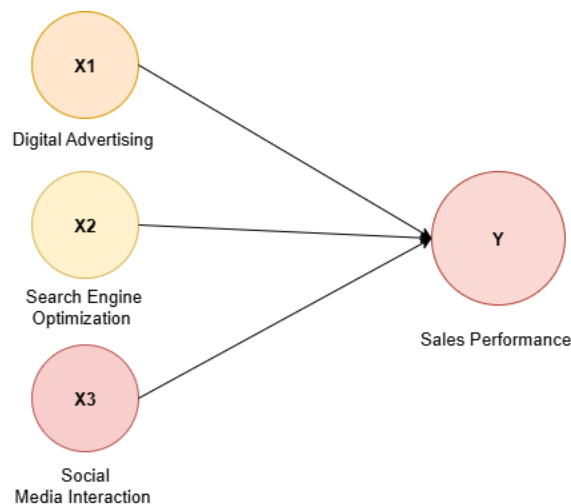


Figure 1. Research Model

##### 3.1.2. Regression Analysis

The results of the multiple regression analysis are presented in Table 2. The regression test shows that digital advertising, SEO, and social media interaction have a significant effect on the sales performance of fisheries startups in East Java.

Table 2. Multiple Regression Results

Variable	Coefficient ( $\beta$ )	t-Statistic	Sig. (p-value)	Result
Digital Advertising (X1)	0.315	3.822	0.000	Significant
SEO (X2)	0.284	3.117	0.002	Significant
Social Media Interaction (X3)	0.352	4.025	0.000	Significant
<b>R<sup>2</sup> = 0.652</b>	<b>F = 71.38</b>	<b>Sig. = 0.000</b>		Model Fit

### 3.1.3. Variable Contribution

Based on the regression results, social media interaction has the strongest influence compared to other variables. Digital advertising and SEO also contribute significantly to improving sales performance.

### 3.1.4. Model Fit

The R<sup>2</sup> value of 0.652 indicates that 65.2% of the variation in sales performance can be explained by digital advertising, SEO, and social media interaction simultaneously. The F-test result (71.38;  $p < 0.01$ ) indicates that the overall regression model is significant.

## 3.2. Discussion

### 3.2.1. The Effect of Digital Advertising on Sales Performance

Digital advertising is an important instrument for fisheries agribusiness startups, especially since product visibility determines consumer decisions. Compared to traditional media, digital platforms allow for more targeted and cost-effective advertising strategies that can influence purchasing behavior. Previous studies confirm that structured digital campaigns can increase consumer awareness and drive purchase intention, especially for perishable products such as fresh fish [15]. The advantage of digital advertising also lies in its ability to personalize marketing messages. With the support of data analytics, advertising messages can be tailored to consumer preferences, increasing engagement and conversion. This is particularly relevant for fresh fish marketing, where the attributes of freshness, origin, and quality assurance are key considerations for consumers [16].

In addition, digital advertising has the advantage of measurability through real-time metrics such as impressions, clicks, and conversions. These characteristics provide opportunities for small-scale businesses to assess the effectiveness of strategies and make adjustments quickly [17]. Visualization is also an important aspect, where high-quality images, short videos, and interactive features are able to convey the value of freshness, sustainability, and authenticity of the product [18]. Furthermore, digital advertising is even more effective when integrated with other digital marketing strategies such as SEO and social media. This synergy not only boosts visibility but also increases consumer loyalty in the long run [19]. However, the effectiveness of digital advertising still faces challenges such as ad fatigue, content competition, and demands for creativity. Therefore, continuous innovation and adaptation are key to keeping campaigns relevant and able to reach the target audience [20].

### 3.2.2. The Role of SEO in Enhancing Online Visibility and Consumer Trust

SEO is a strategic digital strategy because it increases online visibility organically and sustainably. Unlike paid advertising, SEO relies on natural search rankings, making it more cost-effective and suitable for small businesses such as fishery startups. High search rankings encourage increased consumer visits and increase the chances of purchase [21]. Apart from being a visibility tool, SEO also strengthens credibility. Websites that consistently appear in the top search results are perceived as more trustworthy. This is important in fresh fish marketing, where consumers are highly concerned about transparency and quality [22].

In terms of user experience, SEO contributes through ease of navigation, speed of access, and mobile-friendly design. Research shows that user-friendly sites tend to increase customer satisfaction and conversions [23]. Furthermore, keyword analysis allows businesses to tailor content to consumer needs, for example, using location-based keywords such as "fresh fish delivery East Java" to reach the local market more effectively [24]. SEO also provides a competitive advantage by differentiating businesses from competitors through content strategy and local relevance [24]. Another advantage is its sustainable nature. As long as content updates, link building, and technical optimization are performed, SEO will continue to generate consumer traffic in the long run. Thus, SEO is not just a marketing instrument, but also a strategic investment for long-term growth in the digital economy [25].

### **3.2.3. The Impact of Social Media Interaction on Consumer Engagement and Loyalty**

Social media interactions have changed the way businesses communicate with consumers. Platforms such as Instagram, Facebook, and TikTok provide low-cost interactive channels that strengthen relationships with consumers. Quick responses, transparency, and real-time interactions are proven to increase consumer trust and engagement, especially in food products such as fresh fish [3][18]. One of the main roles of social media interaction is to build consumer loyalty. Through consistent content updates, storytelling, and response to comments, businesses can create personalized experiences that increase consumer engagement [19]. Social media also enables co-creation, where consumers share experiences, leave reviews, and create content that strengthens brand credibility [21].

In the context of perishable products, social media serves as an information channel that provides reassurance regarding availability, freshness, and delivery time. This increases the perception of reliability and consumer satisfaction [23]. In addition, engagement metrics such as likes, shares, and comments provide insights for businesses to customize content strategies according to audience preferences [18]. Cumulatively, social media interactions strengthen emotional connections that go beyond transactions. Loyal consumers not only make repeat purchases but also act as brand advocates through recommendations. This makes social media a strategic factor in building long-term engagement and loyalty [19][24].

### **3.2.4. The Combined Effect of Digital Advertising, SEO, and Social Media Interaction on Sales Growth**

An integrated approach through digital advertising, SEO, and social media interaction forms a comprehensive digital marketing strategy that is more effective than using a single strategy. This integration strengthens visibility, credibility, and consumer engagement simultaneously, driving sustainable sales growth [4][18]. Digital advertising serves as a trigger for initial consumer awareness, SEO strengthens credibility through search rankings, while social media builds relational trust. The combination of the three creates a complete consumer journey, from the awareness stage to loyalty. This integrated strategy is believed to be more effective in building consumer trust in perishable products such as fresh fish, where quality, freshness, and delivery reliability are key factors [5][21], [23]. In addition, the use of digital multi-channels increases resource efficiency. Startups can spread their investments across multiple platforms, resulting in more optimized results than focusing on just one strategy [24]. This synergy also provides long-term resilience to market dynamics: digital advertising provides quick visibility, SEO guarantees long-term affordability, and social media maintains continuous engagement.

Overall, digital advertising has a number of significant advantages for fisheries agribusiness startups, including the ability to personalize marketing messages, measurability through real-time metrics, increased awareness and purchase intent, and cost efficiency over traditional media. Integration with other digital strategies, such as SEO and social media, further strengthens visibility, credibility, and consumer engagement, resulting in loyalty and long-term sales growth. However, this strategy also has limitations, such as ad fatigue, high content competition, and the need for continuous creativity and innovation to remain relevant to the target audience. Based on these findings, future research is recommended to explore the implementation of more personalized and adaptive digital advertising strategies, including the use of advanced data analysis, testing new interactive content, and integration with other digital platforms to optimize sales performance and build stronger consumer relationships.

## **4. Conclusion**

This study examined the influence of digital advertising, SEO, and social media interaction on the sales performance of fisheries startups in East Java. The findings indicate that each factor individually has a positive and significant effect on sales, while their combined application produces stronger results, highlighting that digital marketing is essential for startups to thrive in a competitive digital marketplace. Digital advertising enhances consumer awareness and purchase intentions through targeted, cost-efficient, and visually appealing campaigns, whereas SEO strengthens online credibility by improving website visibility and aligning content with consumer search behavior. Social media interaction proved the most influential factor, emphasizing its role in building trust, engagement, and loyalty, which contribute to repeat purchases. The integrated use of these strategies allows startups to optimize resources, reduce risks, and sustain competitive advantage, providing both short-term sales growth and long-term market resilience. The study contributes theoretically by combining three

digital marketing elements into a unified framework and practically by offering actionable insights, suggesting that future initiatives should focus on continuous innovation, skill development, and cross-channel integration to support sustainable business growth in the digital economy.

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