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# DETERMINANTS OF PROFITABILITY AND CHALLENGES OF SMOKED AND DRIED FISH MARKETERS IN LAGOS STATE NIGERIA

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## ABSTRACT
This study investigated the profitability factors and obstacles of smoked and dried fish in Lagos State, Nigeria. The study utilized a multistage sampling approach to get 135 responses. The majority of fish marketers (65.93%) were female, and their typical age, household size, and marketing experience were 43.59 years, 6 people, and 3.5 years, respectively. The marketers cited numerous obstacles they confront in their marketing activities. Despite this, the firm was determined to be highly profitable, as each marketer reported a monthly income of ₦1,035,743.87. Among socioeconomic characteristics, marital status and educational level were 1 percent significant to the profitability level of marketers, whereas gender, age, marketing experience, and membership in cooperative societies were 1 percent significant to the profitability level of marketers in business. It is suggested that a national market development coordination be established to ensure the adoption of standard weight and measure for fish smoking and marketing in the region, and that private individuals and corporate groups maintain cost-effective transportation and smoking service facilities to increase marketer efficiency.

**Keyword:** Smoked fish, Marketers, Net returns, Profitability, Constraints.

## INTRODUCTION
Fish has become one of the healthiest animal-source foods, providing a wide range of vital elements for human consumption. It contributes substantially to food security, and higher consumption reduces hunger, particularly in many poor countries (Adeniyi *et al.*, 2012). Many developing countries' diets are predominantly reliant on a small number of basic commodities, and fish is a very inexpensive and readily accessible source of nutritional variety (FAO, 2018). Protein–energy malnutrition (PEM), which obstructs healthy growth and development, is common in developing nations such as Nigeria throughout the period from conception to the age of two years, which is crucial for the infant's physical, mental, and cognitive development, development, and health (NPC, 2014).

A variety of factors can influence the availability of fish. The perishability of fish, as well as having a range of ways to preserve it, is essential. Freezing, smoking, salting, and sun-drying are a few of these processes. A kiln, an oven, cement blocks, drums, or an iron sheet are typically used to expose fish to wood smoke in order to eliminate moisture. Fish deteriorates quickly due to its perishability if not properly stored or maintained. Because Nigeria's economy is still in its infancy, marketing agricultural products and services, particularly smoked fish, is difficult. Marketers use smoking/fire-drying as a low-cost preservation approach to extend the shelf life of their products. The profitability of smoked fish marketing, according to Osarenren and Ojor (2014), is a profitable activity.

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Various studies have identified poor prices, inadequate fish supply, sales of immature fish, insufficient funding, high transportation costs, insufficient storage facilities, and exorbitant levy and other taxes as factors for fish marketing restrictions (Nsikan *et al.*, 2015). The nature of the product on the one hand, and a lack of a well-organized marketing strategy on the other, were commonly the cause of low efficiency and profit. Meanwhile, the fish trade demands all operations that increase sales revenue while cutting marketing costs in order to be more successful. Furthermore, the processing and marketing activities of the aquaculture business provide the biggest of all job opportunities (Okoronkwo, 2016). Economic evaluation is frequently used to assist policy makers in formulating future goals and making solid investment decisions by allocating financial resources more efficiently (Das *et al.*, 2013; Awolumate *et al.*, 2020). In the fish-smoking sector, both fixed and working capital are required which have to be managed in a more efficient way so that profit maximization can be expected.

According to Warouw *et al.* (2016), working capital is the most important aspect of a firm since it affects the profitability of short-term operational activities that define the quantity of money made. It is vital to examine the profitability and challenges faced by smoked and dried fish marketers in light of the global sustainable development goals of achieving zero hunger, improving health and welfare, fostering inclusive and sustainable economic growth, and raising living standards. As a result, the research's main goal is to look into the determinants of profitability and challenges that confront smoked and dried fish marketers in Lagos, Nigeria.

Specifically, the study was carried out to: describe the socio-economic characteristics of smoked and dried fish marketers in Lagos State, determine the profitability level of the respondents in smoked and dried fish marketing, determine the marketing functions that are carried out by the respondents in the study area and identify the challenges limiting the marketing of smoked and dried fish marketing in Lagos State. Hypothesis of the study was Hoi: Socio-economic characteristics of smoked and dried fish marketers have no significant relationship with the profitability level of the business in Lagos State.

## MATERIALS AND METHODS

The investigation was conducted in Lagos State, which has a land area of 3,577km$^2$ and a population of 17.5 million. Latitude and longitude of the state are around 28040' East and 60020' North. There are three (3) Agricultural Development Programme (ADP) zones in Lagos State. The Lagos state agricultural development agency is the primary government agency tasked with agricultural development and extension service. Lagos state is divided into twenty local government units, with Ikeja serving as the capital. The state is richly endowed with natural bodies of water, including as springs, perennially flowing rivers, lakes, and brackish waters.

### Sampling Procedure

From the study area, 135 participants were selected using multistage sampling techniques. First, the Western, Eastern, and Far-Eastern agricultural zones of the state were consciously designated as ADP agricultural zones. In the second phase, fifteen large fish markets from each of the state's Agricultural zones were selected on purpose. These markets were picked on purpose because they are recognized for their fish business. The markets Ikotun, Mushin, Oyingbo, Mile-12, Oshodi, and Tejuosho were selected from the Western zone. The marketplaces selected from Eastern zones were Morocco and Aregbesola. Balogun, Ebute-Ero, Idumota, Ita-Faaji, Isale-Eko, Jankara, and Oniru were the marketplaces selected on purpose from the Far Eastern region. The third step consisted of a random selection of nine (9)

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respondents from each of the 15 major fish markets outlined previously, resulting in a total of 135 respondents. To obtain information from the respondents, a well-structured questionnaire/interview schedule was used.

**Method of Data Analysis**

Descriptive and inferential statistics were employed to analyze the study's data. The objectives of the study were evaluated using descriptive statistics (frequency table, percentage, mean, and standard deviation), whereas the hypothesis was analyzed using inferential statistics (Logistics regression). Logistic regression is a technique for identifying the association between a set of independent variables and a dichotomous dependent variable (Okwuokenye and Oriakhi, 2014). The model's variables are specified as follows:

$Y = a + b_1X_1 + b_2X_2 + b_3X_3, \ldots, + b_nX_n + e$ …(1)

where,

Y = Marketing margin

a = Constant

$b_i$ (1 – n or 9) = Coefficients

$X_1 – X_7$ = Independent variable

e = Error term

The variable in the equation are defined below;

Y = Profitability level (₦)

$X_1$ = Gender (male = 1; female = 0)

$X_2$ = Age (years)

$X_3$ = Marital status (single, married, divorced, widow and widower)

$X_4$ = Educational level (years)

$X_5$ = Household size (number of people living and feeding together)

$X_6$ = Marketing experience (years)

$X_7$ = Source of capital (Commercial banks, micro finance bank, cooperative society, government, others)

$X_8$ = Religion

$X_9$ = Membership of a cooperative societies.

The gross margin of smoked and dried fish marketers was calculated using a budgetary technique. The gross margin is:

$GMI=\sum TR-\sum TVC$ …(2)

$TR=P_y.Y_i$ …(3)

$TVC=Px_IX$ …(4)

$TC=TCV+TFC$ …(5)

$NI=GM-TFC$ …(6)

where,

GMI = Gross Margin Income (₦)

TR = Total Revenue (₦)

TVC = Total Variable Cost (₦)

TC = Total Cost (₦)

NI = Net Income (₦)

$P_y$ = Unit Price of Output Produced (₦)

Y = Quantity of Output (kg)

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## RESULTS AND DISCUSSION

### Demographic Features of Marketers of Smoked and Dried Fish

Table 1 reveals that the majority of responders (65.93%) were females, while the remainder (34.07%) were males. The presence of both men and women in the business indicates that the smoked and dried fish business is gender-inclusive. This result is comparable to that of Offor *et al.* (2016) who discovered that women played a higher role than men in the marketing of smoked fish. The majority of respondents (34.07%) fell within the age range of 31 to 40 years, with the average age of respondents being 43.59 years old. This indicates that the marketers are young and energetic, and so have the capacity to accomplish more and generate a greater profit than their older colleagues. This finding is supported by the findings of Okwuokenye and Oriakhi (2014), who discovered that active marketers dominate the fish marketing industry. In addition, the results revealed that a greater proportion (63.70%) of the marketers were married. This means that the marketers are responsible and so use their business earnings to support their families.

Regarding educational attainment, the majority of marketers (57.04%) have postsecondary education. This indicates that they can read, write, and comprehend the complexities of business and use this information to increase their degree of business profitability. This finding is supported by Ewuola and Ajibefun (2000), who assert that education increases marketers' capacity to enhance their marketing operations and profit generation. The marketing of smoked and dried fish is dominated by Christians, which may not be unrelated to the fact that Christianity is the predominant faith in the region. This conclusion is consistent with the findings of Odebode and Arimi (2011), who assert Christian supremacy in the fish marketing industry. The majority of respondents (29.63%) responded that the government is their primary source of finance for their businesses. This indicates that the administration of Lagos State supports the fish marketing industry. This finding contradicts that of Okwuokenye and Okoedo-Okojie (2018), who found that commercial banks are the primary source of finance for such businesses.

A substantial proportion (97%) of the marketers indicated that they are members of at least one cooperative society. They may have chosen cooperative societies as a place where they can socialize and receive assistance with their concerns. This claim was supported by the findings of Okwuokenye and Okoedo-Okojie (2018). The respondents' average marketing experience was 3.5 years. The majority (64.44%) have between two and four years of experience. This demonstrates that they are not newcomers to the marketing industry. The respondents' average household size was six people, with the majority (65.93%) having between four and six members. This indicates that they must provide care for those who may become a source of labor for them. According to the findings of Ojo and Ajiofun (2000), the majority of fish markers were large households. This result is similar with the findings of Nwalieji *et al.* (2014), who asserted that a large family size guarantees the availability of labor for marketing operations.

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**Table 1:** Demographic characteristics of smoked and dried fish marketers

| Profile | Variables | Freq. | % | Mean |
|---|---|---|---|---|
| Gender | Female | 89 | 65.93 | |
| | Male | 46 | 34.07 | |
| Age (years) | ≤ 30 | 11 | 8.15 | |
| | 31 - 40 | 46 | 34.07 | |
| | 41 - 50 | 40 | 29.63 | |
| | 51 - 60 | 27 | 20.00 | |
| | > 60 | 11 | 8.15 | 43.59 |
| Marital Status | Single | 21 | 15.56 | |
| | Married | 86 | 63.70 | |
| | Widow | 10 | 7.41 | |
| | Separated/Divorced | 18 | 13.33 | |
| Educational Status | Primary School | 20 | 14.81 | |
| | Secondary School | 38 | 28.15 | |
| | Post Secondary Sch | 77 | 57.04 | |
| Religion | Christianity | 81 | 60.00 | |
| | Islam | 43 | 31.85 | |
| | Others | 11 | 8.15 | |
| Sources of Capital | Commercial Bank | 15 | 11.11 | |
| | Micro finance Bank | 36 | 26.67 | |
| | Corporative Society | 8 | 5.9 | |
| | Government | 40 | 29.63 | |
| | Others | 36 | 26.67 | |
| Membership corporative society | Yes | 97 | 71.85 | |
| | No | 38 | 28.15 | |
| Marketing experience (years) | 0 – 2 | 6 | 4.44 | |
| | 2 - 4 | 87 | 64.44 | |
| | 4 - 6 | 42 | 31.11 | 3.5 |
| Size of the households | 1 – 3 | 6 | 4.44 | |
| | 4 – 6 | 89 | 65.93 | |
| | 7 – 9 | 40 | 29.63 | 5.76 = 6 |

Source: Field survey, 2021

**Gross Margin/Profitability Analysis of Smoked and Dried Fish Marketers**

The gross margin and profitability of the fish marketers' business is presented in Table 2. The analysis was used to determine the enterprises' profitability. The outcome revealed the profitability index, which gauges the viability of a company and serves as a predictor or driver of new market entry or leave. Based on the quantity of sales from the respondent's fish dealers, the total gross income was ₦232,480,000. The components of total variable cost (TVC) totaled ₦92,654,578, which included the cost of fish, the cost of processing, the cost of transportation, the cost of energy, the cost of packaging, and the cost of maintaining equipment. The aggregate gross margin for the month was ₦139,825,423, indicating that marketing smoked and dried fish is successful in the region. Each seller's monthly income was ₦1,035,743.87. Based on current rates, prices, and business conditions, it may be inferred that a typical dried and smoked fish merchant in Lagos State earns more than one million naira each month. This number suggests that the industry for dried and smoked fish in Lagos is profitable. This premise is supported by

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the findings of Ebsobhawan and Ogundele (2011) who discovered that the fish sector is highly profitable and worthy of investment.

**Table 2:** Gross Margin Analysis of Smoked and Dried Fish Marketers

| **Variable Cost Component** | **Amount (₦)** |
|---|---|
| Cost of fish | 43,240,000 |
| Cost of processing | 17,970,000 |
| Transport cost | 14,320,000 |
| Energy cost | 6,342,577 |
| Packaging cost | 5,728,000 |
| Equipment | 5,054,000 |
| Total Variable Cost (TVC) | **92,654,577** |
| Total Gross Income | **232,480,000** |
| Gross Margin (TGI - TVC) | **139,825,423** |
| GM per Fish Marketer | **1,035,743.87** |

Source: Field survey, 2021

**Analysis of Maketing Margin According to Functions**

Table 3 displays the marketing margin outcome based on the marketing functions performed by the fish marketing firm. Among the marketing duties performed, the harvesting of fish from the ponds represented the greatest proportion (22.22%), followed by land charges (18.51%). Other marketing functions with their charges include transportation fees, marketing fees, association dues (which are frequently paid annually), and sorting fees (which involve separating fishes according to size for ease of setting prices). These fees accounted for 14.82%, 14.81%, 16.30%, and 13.2%, respectively. The results indicated that fish harvesting was the most expensive activity performed (in terms of naira), which was related to the lengthy nature of the work and the inherent danger of the operation. This finding is consistent with that of Okwuokenye and Oriakhi (2014) who identified harvesting as the most important marketing activity in the fish company. In the case of land charges, the majority of towns where fishing occurs impose a mandatory fee on marketers before allowing them to sell and purchase fish harvested on their territory. Transportation costs were somewhat high due to the increase in fuel prices at the time of the study, the unpredictability of fish procurement, and the inaccessibility of the villages/towns where the fish were sourced. Through interpersonal dialogue, it was determined that marketing expenses include security fees, social function dues, and store rent paid to the government.

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**Table 3:** Analysis of marketing margin according to functions

| **Component** | **Average cost per kg (₦)** | **Percentage** |
|---|---|---|
| Transportation | 20 | 14.82 |
| Sorting | 18 | 13.33 |
| Harvesting | 30 | 22.22 |
| Land charges | 25 | 18.51 |
| Market charges | 20 | 14.81 |
| Association dues | 22 | 16.30 |
| **Total** | 135 | 100 |

Source: Field survey, 2021

**Challenges Encountered by Smoked and Dried Fish Marketers**

Table 4 depicts the difficulties experienced by fish marketers in their fish business. The problems/challenges were ranked from most severe (large problem) to least severe (little problem) (minor problem). Moreover, concerns indicated by at least 50% of respondents were deemed serious, whereas those recognized by less than 50% were not.

According to the report, operational costs (62.22%), quality standards (62.22%), legal procedures (NAFDAC) (62.22%), and the cost of processing equipment (62.22%) listed as the most or most significant obstacles for marketers in the fishing industry. Lack of training institute (61.46%) and availability to finance facilities (60%) were ranked as the fifth and sixth most significant obstacles to the marketing of smoked and dried fish in the study area, respectively. Lack of raw material availability (59.3%), competition (59.3%), infrastructure facilities (59.3%), and electricity were ranked as the sixth most critical problems/challenges by respondents (59.3%). In addition, respondents ranked the expense of transportation (56.3%), finance and welfare measures (56.3%), and inadequate extension services (56.3%) as the eighth most severe limitations on company. Price (54.1%) of the fishes and for the functions they must pay for, trade barrier (tariff and non-tariff) (54.1%), and storage facilities (54.1%) were the final obstacles (54.1%).

The multiple problems/challenges involved with the fish marketing industry can be ascribed to the numerous steps the items must undergo between manufacture and marketing. It is essential to recognize that these concerns are unique to each marketer and depend on their current circumstances. This result aligns with that of Ebsobhawan and Ogundele (2011) and Odebode and Arimi (2011). In their extensive research, these authors determined that the fish company faces several limitations, including high transportation expenses, a lack of funds, and loan collection difficulties.

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**Table 4:** Challenges Encountered by Smoked and Dried Fish Marketers

| Problem encounter | Insignificant | Minor | Moderate | Major | Ranking |
|---|---|---|---|---|---|
| Quality Standards | 8(5.8%) | 6(4.4%) | 37(27.4%) | 83(62.22.1%) | 1st |
| Operational cost | 8(5.9%) | 6(4.4%) | 37(27.4%) | 83(62.22%) | 1st |
| Cost of processing equipment | 8(5.9%) | 6(4.4%) | 37(27.4%) | 83(62.22%) | 1st |
| Legal Procedures (NAFDAC) | 8(5.9%) | 6(4.4%) | 37(27.4%) | 83(62.22%) | 1st |
| Lack Training institute | 6(4.4%) | 6(4.4%) | 40(29.0%) | 83(61.48%) | 5th |
| Access to credit facilities/inadequate capital | 6(4.4%) | 10(7.4%) | 38(28.1%) | 81(60%) | 6th |
| Supply of raw material | 6(4.4%) | 6(4.4%) | 43(31.9%) | 80(59.3%) | 7th |
| Competition | 6(4.4%) | 10(7.4%) | 40(29.6%) | 80(59.3%) | 7th |
| Infrastructure Facilities | 6(4.4%) | 6(4.4%) | 43(31.9%) | 80(59.3%) | 7th |
| Electricity | 6(4.4%) | 6(4.4%) | 43(31.9%) | 80(59.3%) | 7th |
| Cost of Transportation | 9(6.7%) | 15(11.11%) | 35(25.9%) | 76(56.3%) | 11th |
| Finance & Welfare Measures | 9(6.7%) | 15(11.11%) | 35(25.9%) | 76(56.3%) | 11th |
| Extension Services | 9(6.7%) | 15(11.11%) | 35(25.9%) | 76(56.3%) | 11$^{th}$ |
| Price | 10(7.4%) | 6(4.4%) | 50(34.1%) | 73(54.1%) | 14th |
| Trade Barrier (Tariff & Non-Tariff) | 10(7.4%) | 6(4.4%) | 50(34.1.0%) | 73(54.1%) | 14th |
| Storage facilities | 6(4.4%) | 6(4.4%) | 50(37.0%) | 73(54.1%) | 14th |
| Government support | 6(4.4%) | 20(14.8%) | 67(49.6%) | 42(31.1%) | 17th |
| Value Added Products | 11(8.2%) | 26(19.3%) | 83(61.58%) | 15(11.11%) | 18$^{th}$ |
| Information about foreign market | 11(8.14%) | 26(19.25%) | 83(61.48%) | 15(11.11%) | 18th |

Source: Field survey, 2021

**Relationship between Socio-economic Characteristics of the Respondents and Profitability Level of the Marketers**

The investigation of the association between respondents' socioeconomic factors and their level of profitability is presented in Table 5. The model's coefficient of determination ($R^2$) (0.680) indicates that the explanatory factors accounted for approximately 68 percent of the variance in the dependent variables, i.e., the level of profitability in the selling of smoked and dried fish. The results in the Table 5 have been ordered by magnitude, and the model was statistically significant at the 1% level. Six of the eight explanatory factors were statistically significant. Two of them (marriage status and educational status) were significant at the 1%

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level, whereas sex, age, marketing experience, and cooperative society participation were significant at the 5% level. These variables are further described as follows:

This variable, sex (b= 8.629; t= 3.578), had a positive sign and was statistically significant at the 5% level. Since women comprise the majority, it follows that the predicted level of profitability would increase as more women engage in the sale of dried and smoked fish. The ratio was 2.418, which indicates that having more women participating in the marketing of dried and smoked fish will result in a twofold increase in profitability compared to if only men were involved. Ebsobhawan and Ogundele (2011) found that women predominate in the marketing of fresh fish, and this is likely attributable to the degree of profit they are expected to earn in the industry. The respondents' age was associated with a beta coefficient of -7.367 and a t-value of -3.014). The connection was significantly negative and significant at the 5% level. The result suggests that older individuals will earn less money than their younger colleagues. This may result from an unwillingness to compromise and a lack of strength comparable to that of their younger peers. The atypical ratio was 2,912. This indicates that younger marketers will generate around three times the profitability of their older colleagues. According to the findings of Okwuokenye and Onemolease (2006), younger marketers have a higher profit margin on agricultural items.

The beta coefficient, t-value, and odd ratio of marital status were, respectively, 4.54, 2.216, and 1.03. The association is statistically significant at the 1% level. Due to the fact that married persons comprised the majority, the outcome suggests that having more married marketers in the organization will continue to increase profitability. The marketers' marketing experience revealed a beta coefficient of 2.31 and a t-value of 0.142. The association is significant and positive at the 5% level. The conclusion indicates that the projected level of profitability will increase proportionally to the number of years of experience a marketer has. The odd ratio is 3.431, which indicates that having greater experience in the marketing of smoked and dried fish will result in up to three times as much profit as inexperienced marketers. This conclusion is reinforced by Oyekale et al. (2003), who found that a large sales margin is achieved by marketers with more marketing experience.

Membership in cooperative organizations (b = 2.93; t = 1.072) has a favorable and substantial effect on the level of profitability of marketers. The implication is that cooperative society members will generate greater profits than non-members. This may be due to the teamwork and synergy support they receive from other members of the same group. The final variable (educational status) was positively signed and statistically significant at the 1% level. This suggests that education has the potential to improve the performance of marketers in their marketing endeavors. The odd ratio was 3.012, which indicates that educated marketers will earn up to three times as much as their uneducated competitors. This result is consistent with that of Okwuokenye and Onemolease (2006), who found that the more educated a marketer is, the greater the likelihood that he or she will earn a bigger profit margin from their business.

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**Table 5:** Relationship between socio-economic characteristics and the profitability level of the marketers

| Explanatory Variables | Standard Coefficient (Beta) | t – values | Odd ratio |
|---|---|---|---|
| Constant | 16.593 | 214.192 | 5.043 |
| Sex | 8.629* | 3.578 | 2.418 |
| Age | -7.367* | -3.014 | 2.912 |
| Marital status | 4.545** | 2.216 | 1.003 |
| Marketing experience | 2.311* | 0.142 | 3.431 |
| Member of cooperative societies | 2.937* | 1.072 | 2.110 |
| Sources of capital | -1.721 | -1.002 | 0.152 |
| Education status | 1.224** | 0.133 | 3.012 |
| Household size | 1.025 | 1.016 | 0.007 |

*Significant at 1% level; **Significant at 5% level; Adjusted $R^2$= 0.680; F-Statistics = 97.014; Critical F = 6.63
Source: Field survey, 2021

## CONCLUSION AND RECOMMENDATIONS

The study found that the marketing of smoked and dried fish is highly profitable, despite the fact that many marketing tasks must be performed in order to generate a large profit margin. The survey also indicated that the business's marketers face numerous obstacles, and if this were not the case, more revenues would have been made. On the basis of the study's findings, the research suggests establishing a national market development coordination to assure the adoption of standard weights and measures for fish smoking and marketing throughout the region. In addition, the study suggests that private persons and business organizations maintain cost-effective transportation and smoking service facilities to boost their efficiency. In addition, the government must make available to farmers more accommodating and realistic financial institutions from whom they can readily obtain funds for expanding their businesses.

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