

THE IMPACT OF INTERNATIONAL TOURISTS ON REGIONAL ECONOMIC GROWTH, 2014–2024

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Abstract:

Purpose:

This study analyzes the effects of international tourist arrivals, the number of star-rated hotels, labor, and road infrastructure on Gross Regional Domestic Product (GRDP) across major tourism-destination provinces in Indonesia.

Keyword:

International Tourists, GRDP, Regional Economic Growth, Labor, Star-Rated Hotels, Road Infrastructure

Methodology:

The study uses annual panel data for 13 major tourist-destination provinces in Indonesia during 2014–2024, yielding 143 observations. Panel-data regression is estimated using Common Effect, Fixed Effect, and Random Effect specifications, with model selection based on the Chow, Lagrange Multiplier, and Hausman tests.

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Findings:

The Fixed Effect Model is selected as the most appropriate specification. Labor has a positive and statistically significant effect on GRDP (coefficient = 4.1422; $p = 0.0004$), whereas international tourist arrivals, star-rated hotels, and road infrastructure are not statistically significant. The model has an R^2 of 0.4969 and is jointly significant.

Paper Type:



Research Paper

Implication:

Regional tourism development should be integrated with improvements in labor productivity, the quality and utilization of supporting facilities, infrastructure connectivity, and stronger linkages with local economic activity so that tourism can generate a greater contribution to regional economic performance.

INTRODUCTION

Tourism is an economic sector with broad linkages to production, consumption, investment, and employment activities at both the national and regional levels. Tourism development is determined not only by the presence of destinations, but also by a region's capacity to attract and serve tourists through accessibility, infrastructure, accommodation facilities, safety, and service quality. Gidebo (2021) shows that international tourist flows to a destination are influenced by a combination of economic conditions, accessibility, infrastructure, destination attractiveness, safety, and the quality of tourism facilities. Thus, international tourist arrivals should not be viewed as an isolated activity, but rather as part of an economic ecosystem involving various supporting sectors.

The relationship between tourism development and economic growth has received considerable attention in empirical studies. Enilov and Wang (2021) demonstrate a relationship between tourism activity and economic growth. From an economic perspective, tourist arrivals generate additional demand for accommodation, transportation, trade, food and beverages, and various other services. This increase in demand may stimulate production, employment absorption, business income, and economic activity in destination regions. Through these intersectoral linkages, tourism can generate a multiplier effect that may ultimately be reflected in higher regional economic output. This argument provides an important basis for examining the extent to which increased tourism activity is genuinely associated with regional economic performance.

However, the magnitude of the economic benefits generated by tourism is not uniform across regions. Each destination has different characteristics, resources, attractions, facilities, and economic capacities. In the Indonesian context, Thaha and Aziz (2020), through a study of tourism destinations in Greater Bandung using Tangkuban Perahu and Kawah Putih as case studies, show that destination characteristics can shape tourists' attention and perceptions. Such differences suggest that each region may also differ in its ability to attract tourists and convert tourism activity into economic value added.

In addition to the number of visits, tourist quality and characteristics are important for understanding tourism's economic contribution. Agustina et al. (2021) emphasize the importance of foreign tourist characteristics

in assessing the quality of tourists visiting Indonesia. This implies that the economic contribution of international tourists depends not only on the number of arrivals, but also on their patterns of economic activity while at the destination. A high number of visits does not necessarily generate an optimal economic impact if it is not accompanied by longer stays, higher consumption, the use of local facilities, and stronger linkages with economic activities in the destination region.

Tourist mobility patterns further underscore the complexity of the relationship between tourism and regional economies. Ramadhani et al. (2024), in their study of tourist behavior, perceptions, and mobility at leading destinations in Bali, show that tourist movement patterns are related to the characteristics of the destinations visited. Such mobility can create economic activity both directly and indirectly through the consumption of goods and services across various supporting sectors. Therefore, a region's ability to derive economic benefits from tourists depends strongly on the connectivity between tourism destinations and accommodation, labor, transportation, trade, and other local economic activities.

The link between tourism development and regional economies is also evident at the subnational policy level. Wulandari and Afriyanni (2021), through their study of tourism development policy in the Riau Islands Province, identify a relationship between tourism-sector development and the regional economy. However, the contribution may vary across regions due to differences in economic conditions, infrastructure availability, tourism facilities, and regional characteristics. Consequently, an increase in tourist numbers alone is insufficient to explain variations in regional economic performance without considering the capacity and supporting factors available in each region.

This issue is particularly relevant in Indonesia, where economic and tourism conditions are highly heterogeneous across provinces. Several provinces serve as major destinations for international tourists while simultaneously differing in hotel availability, labor supply, infrastructure, and economic capacity. Accordingly, the relationship between international tourist arrivals and Gross Regional Domestic Product (GRDP) needs to be analyzed together with the factors that support tourism-related economic activity. In this study, the number of star-rated hotels represents accommodation capacity, labor represents a production factor supporting economic activity, and road infrastructure represents connectivity that enables the movement of people, goods, and services. These variables, together with international tourist arrivals, are analyzed in relation to regional GRDP.

A temporal dimension is also important in this study. The 2014–2024 period encompasses major changes in the tourism sector, ranging from the pre-pandemic period and the shock caused by the COVID-19 pandemic to the post-pandemic recovery phase. These conditions may have altered the relationship between tourism and regional economies in ways that would not be captured by an analysis covering only a relatively short period. This study uses eleven years of annual data for 13 major Indonesian provinces that are destinations for international tourists: North Sumatra, West Sumatra, Riau, Riau Islands, DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, Banten, Bali, West Nusa Tenggara, and North Sulawesi. The selected period allows the analysis to cover the pre-pandemic expansion of 2014–2019, the crisis in 2020–2021, and the economic and tourism recovery during 2022–2024.

Previous studies have documented relationships among tourism, economic growth, tourist characteristics, tourist mobility behavior, and tourism development in specific regions. However, there remains a need to examine these relationships more comprehensively at the provincial level in Indonesia while accounting for cross-regional heterogeneity and a period that includes a major shock to the tourism industry. This study addresses that need by integrating tourism-activity indicators and supporting economic factors within a cross-provincial panel-data framework. This approach makes it possible to capture not only variation across provinces, but also changes within each province throughout the study period.

Accordingly, the main contribution of this study lies in empirically testing the relationship between international tourist arrivals and regional economic performance while simultaneously accounting for accommodation capacity, labor, and road infrastructure across 13 major tourism-destination provinces in Indonesia over the 2014–2024 period. This time span is particularly important because it includes conditions before, during, and after the COVID-19 pandemic, thereby providing a longer-term perspective on the dynamics of the relationship between the tourism sector and regional economies.

Based on the foregoing discussion, this study aims to analyze the effects of international tourist arrivals, the number of star-rated hotels, labor, and road infrastructure on Gross Regional Domestic Product (GRDP) in 13 major Indonesian provinces that serve as destinations for international tourists during 2014–2024. The analysis

employs a panel-data regression approach to accommodate both cross-provincial variation and changes over time. In the undergraduate thesis, the primary research question focused on the statistical significance of the effect of international tourist arrivals on GRDP in the provinces receiving the largest numbers of international tourists during the observation period.

LITERATURE REVIEW

Regional Economic Development and Provincial GRDP

GRDP is a key indicator used to describe the economic capacity and development of a region. Changes in GRDP are influenced by various factors, including labor, investment, infrastructure, and leading regional sectors. Widodo and Setiawati (2025) show that labor and investment contribute to increasing GRDP, while Widiani and Dewi (2025) emphasize that the characteristics of a region's leading sectors also affect regional economic performance. In the tourism context, Abdillah and Imaningsih (2024) likewise show that tourism activity can contribute to GRDP formation through increased demand for goods and services.

Investment in Star-Rated Hotels

Star-rated hotels represent a form of investment in the tourism sector that expands accommodation capacity and supports regional economic activity. An increase in the number of hotels can promote employment, economic transactions, and activity in other supporting sectors. Harb and Bassil (2020), Nisa and Khoirudin (2025), and Putri and Yuliawan (2024) show that the development of tourism facilities and activities is associated with economic growth and GRDP formation.

Road Infrastructure

Road infrastructure plays a role in improving connectivity, the mobility of people and goods, and distribution efficiency. Ng et al. (2019) explain that road development can support economic growth by improving access to commercial activities, while Sharma et al. (2024) identify a relationship between transportation infrastructure and economic growth. Therefore, improvements in road quality and availability can theoretically support economic activity and regional GRDP.

Employment

Labor is a factor of production that directly contributes to the creation of goods and services. The greater the amount of labor absorbed into economic activities, the greater the potential increase in regional output. Olamade (2020) emphasizes the relationship between economic growth and job creation, while Nisa and Khoirudin (2025) show that labor is an important component supporting economic activity in the tourism sector.

Previous Studies

Previous studies indicate that international tourists, star-rated hotels, labor, and road infrastructure are associated with regional economic growth. Xia et al. (2021) and Khan et al. (2020) support the relationship between tourism development and economic growth. Harb and Bassil (2020) and Putri and Yuliawan (2024) demonstrate the importance of accommodation facilities, while Ng et al. (2019) and Sharma et al. (2024) emphasize the role of road infrastructure. Meanwhile, Olamade (2020) and Nisa and Khoirudin (2025) show that labor contributes to the formation of economic output. Based on these findings, this study examines the effects of international tourists, star-rated hotels, labor, and road infrastructure on GRDP across 13 Indonesian provinces.

Hypothesis Development

The Effect of International Tourists on GRDP

International tourists can potentially increase economic activity through expenditure on accommodation, transportation, food and beverages, trade, recreation, and various other services. This increase in demand can generate multiplier effects on production activity and regional income. Xia et al. (2021) identify a relationship between tourism development and economic growth through the tourism-led growth hypothesis, while Khan et al. (2020) position tourism as an instrument of economic development in developing economies. On this basis, an increase in international tourist arrivals is theoretically expected to increase regional GRDP.

H1: The number of international tourists has a positive effect on regional GRDP.

The Effect of Star-Rated Hotels on GRDP

Star-rated hotels reflect both accommodation capacity and investment in the tourism sector. An increase in the number of hotels can expand a region's capacity to host tourists, create employment opportunities, and stimulate trade and service activities. Harb and Bassil (2020), Nisa and Khoirudin (2025), and Putri and Yuliawan (2024) show that the development of tourism facilities is associated with regional economic activity and growth.

H2: The number of star-rated hotels has a positive effect on regional GRDP.

The Effect of Labor on GRDP

Labor is one of the principal factors of production used to produce goods and services. An increase in the labor force engaged in economic activity can raise production capacity and subsequently promote growth in regional output. Olamade (2020) shows a relationship between economic growth and job creation, while Nisa and Khoirudin (2025) emphasize the importance of labor in supporting economic activity in the tourism sector.

H3: Labor has a positive effect on regional GRDP.

The Effect of Road Infrastructure on GRDP

Road infrastructure supports connectivity, the mobility of people and goods, and distribution efficiency across regions. Better infrastructure can reduce transportation barriers, expand market access, and support both trade and tourism activities. Ng et al. (2019) explain that road development can support economic growth by improving access to commercial activities, while Sharma et al. (2024) show a relationship between transportation infrastructure and economic growth.

H4: Road infrastructure has a positive effect on regional GRDP.

Conceptual Framework

Based on the theoretical framework and previous studies, this research specifies Gross Regional Domestic Product (GRDP) as the dependent variable, while the number of international tourists, the number of star-rated hotels, labor, and road infrastructure are specified as independent variables. Conceptually, all four variables are expected to have positive relationships with GRDP because they respectively represent tourism activity, accommodation capacity, a factor of production, and economic connectivity.

The conceptual framework of the study is illustrated as follows:

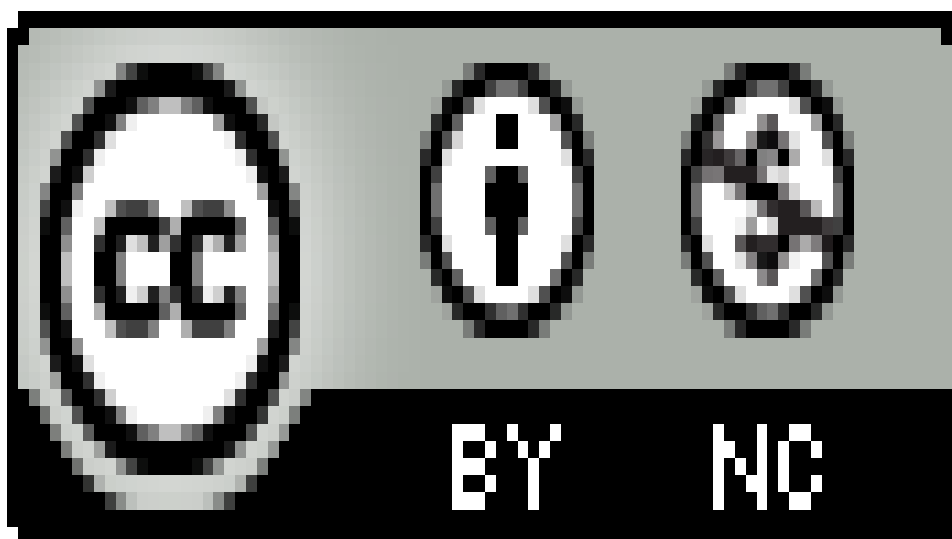


Figure 1. Research Conceptual Framework

METHODOLOGY

This study employs a quantitative approach using panel-data regression analysis to examine the effects of international tourist arrivals, the number of star-rated hotels, labor, and road infrastructure on Gross Regional Domestic Product (GRDP). The units of analysis comprise 13 Indonesian provinces—North Sumatra, West Sumatra, Riau, Riau Islands, DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, Banten, Bali, West Nusa Tenggara, and North Sulawesi—over the 2014–2024 period. The study uses secondary data obtained primarily from Statistics Indonesia (Badan Pusat Statistik, BPS), including GRDP at constant prices, the number of international tourist arrivals, the number of star-rated hotels, the number of employed persons, and road length.

The analysis applies three panel-data estimation approaches: the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Model selection is conducted using the Chow test, Lagrange Multiplier test, and Hausman test. Once the most appropriate model is selected, multicollinearity is assessed using a correlation matrix of the independent variables, while heteroskedasticity is tested using the Likelihood Ratio Test. The final stage evaluates the statistical significance of the regression coefficients to assess the effect of each independent variable on regional GRDP.

RESULTS AND DISCUSSION

RESULTS

Descriptive Statistics

The study uses 143 observations covering 13 provinces over the 2014–2024 period. Mean GRDP is IDR 149,560.8 billion, while the mean number of international tourists is 36,020,230 persons. The mean number of star-rated hotels is 26.26 units, the mean labor figure is 7,086.75 persons, and the mean road length is 1,953.89 km. The substantial differences between the minimum and maximum values indicate pronounced heterogeneity across provinces in economic, tourism, employment, and infrastructure characteristics.

Table 1. Descriptive Statistics

Statistic	GRDP	TOURISTS	HOTELS	LABOR	ROADS
Mean	149,560.8	36,020,230	26.2587	7,086.752	1,953.888
Median	57,083.0	14,521,431	18.0000	3,011.400	1,525.000
Maximum	2,825,479	219,000,000	72.0000	25,116.90	7,041.000
Minimum	23,787.0	379,169	1.0000	780.500	53.000
Std. Dev.	299,532.4	48,275,720	19.4675	7,497.446	1,488.851
Obs.	143	143	143	143	143

Source: Authors' calculations based on the research data.

Model Selection and Assumption Tests

The Chow test yields a probability value of 0.0000, indicating that the Fixed Effect Model (FEM) is more appropriate than the Common Effect Model. The Lagrange Multiplier test produces a probability value of 0.0000, indicating that the Random Effect Model is preferable to the CEM. Subsequently, the Hausman test yields a probability value of 0.0063, leading to the selection of the FEM as the final model for this study.

Table 2. Panel Data Model Selection Results

Test	Statistic/Probability	Decision
Chow Test	Prob. = 0.0000	FEM
LM Breusch-Pagan	Prob. = 0.0000	REM
Hausman Test	Prob. = 0.0063	FEM

Source: Authors' calculations based on the research data.

The multicollinearity test results show that all correlations among the independent variables are below 0.80, indicating no evidence of multicollinearity. The heteroskedasticity test using the Likelihood Ratio Test yields a probability value of 0.1188, indicating that the residuals are homoskedastic. Therefore, the selected model satisfies the diagnostic tests applied in this study.

Fixed Effect Model Estimation Results

The FEM estimation results show that labor is the only variable with a positive and statistically significant effect on GRDP. Meanwhile, international tourists, star-rated hotels, and road infrastructure do not exhibit statistically significant effects. The R^2 value of 0.496922 indicates that approximately 49.69% of the variation in GRDP is explained by the model, while the F-statistic probability of 0.000000 indicates that the model is jointly significant.

Table 3. Fixed Effect Model Estimation Results

Variable	Coeff.	Probability	Description
ln(TOURISTS)	-0.1290	0.2200	Not significant
ln(HOTELS)	-0.0626	0.6674	Not significant
ln(LABOR)	4.1422***	0.0004	Positive and significant
ln(ROADS)	-0.1606	0.2722	Not significant
Constant	-19.7914**	0.0201	Significant
R^2	0.496922		
Prob. F-statistic	0.000000		

*** significant at $\alpha = 1\%$; ** significant at $\alpha = 5\%$.

Source: Authors' estimation results.

DISCUSSION

The Effect of International Tourists on GRDP

The estimation results show that international tourists have a coefficient of -0.1290 with a probability value of 0.2200, indicating no statistically significant effect on GRDP. This finding suggests that an increase in tourist arrivals does not automatically translate into higher regional economic output. In other words, a large number of tourists does not necessarily generate a strong economic impact when tourist expenditure, length of stay, and linkages with local economic activities remain limited.

This result differs from the tourism-led growth hypothesis, which identifies tourism activity as one of the drivers of economic growth. Xia et al. (2021) find a relationship between tourism development and economic growth, while Khan et al. (2020) show that tourism can serve as a development instrument in developing economies. These differing results indicate that the contribution of tourists to economic growth depends strongly on regional characteristics, economic structure, and the ability of a region to capture and retain tourist expenditure.

In addition, the 2014–2024 study period includes the COVID-19 pandemic in 2020–2021, which caused a sharp decline in international tourist mobility. This shock may have weakened the consistency of the relationship between tourist numbers and economic activity during the observation period. Therefore, the findings indicate that the number of visits alone is insufficient to comprehensively represent tourism's economic contribution.

The Effect of Star-Rated Hotels on GRDP

The number of star-rated hotels has a coefficient of -0.0626 with a probability value of 0.6674, indicating no statistically significant effect on GRDP. This result suggests that greater accommodation capacity does not directly increase regional output. The number of hotels essentially reflects the availability of facilities, whereas the economic impact depends more heavily on the extent to which those facilities are utilized.

This finding suggests that physical investment in the accommodation sector does not necessarily generate economic value added unless it is accompanied by adequate occupancy rates, tourism demand, and supporting economic activity. Putri and Yuliawan (2024) include the number of hotels as one of the factors contributing to tourism-sector GRDP, while Harb and Bassil (2020) demonstrate a relationship between tourism activity and regional economic growth. However, the findings of this study indicate that the presence of hotels alone is insufficient to explain regional economic growth.

Differences in the distribution of hotels across provinces may also be an important factor. Provinces with relatively large numbers of hotels do not necessarily have the same utilization rates, while regions with fewer hotels may experience greater utilization intensity. Therefore, the effectiveness of the hotel sector in promoting GRDP is better understood through a combination of hotel numbers, occupancy rates, length of stay, and linkages with local economic sectors.

The Effect of Labor on GRDP

Labor is the only independent variable that has a positive and statistically significant effect on GRDP, with a coefficient of 4.1422 and a probability value of 0.0004. Because the model uses logarithmic transformations, a 1% increase in labor is associated with an approximately 4.14% increase in GRDP, *ceteris paribus*.

This finding underscores the importance of labor as a factor of production in generating regional output. A larger labor force enables regions to expand the production capacity of goods and services across sectors, including trade, services, construction, and tourism-related activities. This result is consistent with Olamide (2020), who identifies a relationship between economic growth and the economy's capacity to create employment opportunities, and Nisa and Khoirudin (2025), who position labor as an important component of economic activity in the tourism sector.

The magnitude of the labor coefficient also indicates that the economic structures of the provinces examined remain relatively dependent on labor-intensive activities. This suggests that an increase in labor can directly expand production capacity. However, the implication of this finding extends beyond the quantity of labor. In the long run, productivity, skills, education, and the ability of workers to integrate into higher-value-added economic sectors become increasingly important for increasing regional GRDP.

The Effect of Road Infrastructure on GRDP

Road infrastructure has a coefficient of -0.1606 with a probability value of 0.2722, indicating no statistically significant effect on GRDP. This result suggests that road length, as a quantitative measure, is insufficient to explain increases in regional economic output.

This finding differs from Ng et al. (2019), who show that road development can increase mobility and support economic growth, and Sharma et al. (2024), who identify a relationship between transportation infrastructure and economic growth. The difference may be attributable to the indicator used in this study, namely road length. This measure does not fully capture road-surface quality, road condition, accessibility, connectivity to economic centers, or the ability of roads to reduce distribution costs.

Moreover, the impact of infrastructure investment does not necessarily emerge in the same period in which construction occurs. Infrastructure may require time before it creates new centers of economic activity, increases trade, or expands mobility. Thus, the statistical insignificance of the road variable does not imply that infrastructure is unimportant; rather, it indicates that road length alone is insufficient to represent infrastructure's contribution to regional economic growth.

Overall Implications of the Findings

Overall, the results show that increased tourism activity and the development of supporting facilities do not automatically generate regional economic growth. International tourists, star-rated hotels, and road infrastructure do not have individually significant effects, whereas labor emerges as the most consistent factor in explaining changes in GRDP.

These findings indicate that the effectiveness of the tourism sector depends strongly on a region's ability to connect tourism activity with the local economic structure. An increase in tourist numbers needs to be accompanied by higher tourist expenditure, longer stays, greater participation of micro, small, and medium-sized enterprises (MSMEs), higher hotel occupancy, and stronger local supply chains. Likewise, infrastructure development should focus not only on quantity, but also on quality and connectivity.

Accordingly, tourism development aimed at promoting regional economic growth requires a more integrated approach. Improvements in labor quality, tourism-sector productivity, the utilization of accommodation facilities, and infrastructure quality need to progress simultaneously if tourism activity is to create stronger economic value added.

CONCLUSION

This study analyzes the effects of international tourists, the number of star-rated hotels, labor, and road infrastructure on Gross Regional Domestic Product (GRDP) in 13 major tourism-destination provinces in Indonesia during 2014–2024. Based on the panel-data regression estimates, the Fixed Effect Model (FEM) is selected as the most appropriate model. The findings show that labor is the only variable with a positive and

statistically significant effect on GRDP, whereas international tourists, the number of star-rated hotels, and road infrastructure do not have statistically significant effects.

The findings indicate that, over the study period, regional production capacity is more strongly explained by labor-related factors than by the tourism and infrastructure indicators employed. The statistically insignificant effects of international tourists and star-rated hotels suggest that increases in visitor numbers and accommodation facilities do not automatically translate into higher regional output. This result should be interpreted in the context of differences in economic capacity across provinces, varying levels of tourism-facility utilization, and a study period that includes the COVID-19 pandemic shock. Meanwhile, the insignificant effect of road infrastructure indicates that road length as a quantitative measure is insufficient to capture infrastructure's contribution to economic growth without considering quality, connectivity, and utilization effectiveness.

Overall, the findings emphasize that regional tourism development should not focus solely on increasing tourist numbers, constructing hotels, or expanding physical infrastructure. More effective policy should be directed toward improving labor quality and productivity, strengthening linkages between the tourism sector and local economic activity, increasing the utilization of accommodation facilities, and improving infrastructure quality and connectivity. Through such an approach, the economic benefits of tourism development can be optimized and can make a stronger contribution to regional economic growth.

This study remains subject to several limitations because it uses the number of tourists, the number of hotels, labor, and road length as indicators without incorporating other dimensions such as tourist expenditure, length of stay, hotel occupancy rates, infrastructure quality, tourism investment, or the economic structure of each province. Future research may incorporate these variables and explicitly account for structural effects before, during, and after the pandemic to provide a more comprehensive understanding of the relationship between tourism and regional economic growth.

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