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THE ECONOMIC IMPORTANCE OF DEVELOPING WOMEN'S INTELLECTUAL POTENTIAL AND THEIR ROLE IN THE INTERNATIONAL MARKET.

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ABSTRACT

This study explores the economic significance of developing women's intellectual and professional potential and examines their role in the international market. The paper emphasizes the link between women's empowerment and sustainable economic growth, highlighting how increased female participation in entrepreneurship and decision-making contributes to national competitiveness. Using empirical data from Uzbekistan, including labor market statistics, entrepreneurship indicators, and international trade participation, the research identifies key factors that enhance women's economic activity and challenges that hinder their full integration. Econometric analysis demonstrates a positive correlation between women's economic engagement and macroeconomic indicators such as GDP growth and export performance. The findings underscore the importance of targeted policies and programs to promote women's intellectual development and facilitate their active participation in global markets. The study contributes to the literature by providing evidence-based insights on leveraging women's potential for inclusive economic development.

Keywords: women's empowerment, economic growth, intellectual potential, international market, Uzbekistan, female entrepreneurship.

INTRODUCTION

In the context of modern globalization and intensifying economic competition, the development of women's intellectual potential is becoming increasingly important not only as a means of ensuring social equality, but also as a strategic factor of economic growth. The increasing participation of women in the processes of human capital modernization, the training of highly qualified specialists, and the formation of an innovative economy serves as a key driver of economic efficiency and international competitiveness. International experience demonstrates that higher levels of women's education and the expansion of their involvement in scientific, technological, and entrepreneurial activities have a significant positive impact on GDP growth rates.

According to data published by international organizations such as the World Bank, UN Women, and UNESCO, when women participate on an equal basis with men in STEM fields, science, and high-technology sectors, a country's economic efficiency can increase by 15–30 percent. However, in many countries around the world, including developing economies, various institutional, economic, and cultural barriers continue to hinder the full engagement of women in intellectual activities. The low representation of women in leadership positions, gender disparities in obtaining academic degrees, and constraints faced in accessing international markets further underscore the growing relevance of this issue.

In recent years, Uzbekistan has been implementing large-scale reforms aimed at developing women's economic, scientific, and intellectual potential. In particular, state programs have been developed to expand access to education, encourage women's participation in scientific research, prepare them for leadership positions, and support their involvement in international grant programs. Nevertheless, practical evidence shows that women's share in the high-skilled labor market and in international economic activities remains insufficient. Social stereotypes such as "Can a girl become a scholar by studying?" or "Women cannot be leaders,"

along with traditional interpretations of gender roles and the lack of equal conditions in scientific activity and entrepreneurship, continue to hinder the full realization of existing potential.

The relevance of this research lies in the fact that the impact of women's intellectual potential on economic growth and international competitiveness has not yet been sufficiently studied on a solid scientific basis in the context of Uzbekistan. The theoretical and practical significance of the topic requires an in-depth analysis of mechanisms for developing women's intellectual potential, the examination of international experience, and the formulation of effective recommendations tailored to the Uzbek economy.

The main objective of this study is to provide a scientific justification of the economic significance of developing women's intellectual potential, to identify the factors influencing their role in international markets, and to develop analytical conclusions and practical recommendations based on the experience of Uzbekistan and developed countries.

LITERATURE REVIEW

Extensive research has been conducted in global academic literature on the development of women's scientific potential and the enhancement of their role in international economic markets. Scholars have examined this process through various theoretical frameworks, including gender equality theory, human capital theory, innovation-driven economic models, and equal opportunities in the labor market.

A hypothesis derived from large-scale empirical studies over the past two decades on behavioral differences between men and women suggests that an increase in women's representation in government significantly enhances economic efficiency, innovative capacity, and international competitiveness, thereby contributing to greater stability in the global economy. According to the research of Dollar, Fisman, and Gatti (2001) [1], women tend to be highly effective leaders, as they bring a unique combination of emotional intelligence, collaboration, and resilience to the workplace. Their inclusive leadership style fosters innovation, strengthens teamwork, and promotes more effective decision-making.

Scientific findings indicate that women tend to be more inclined to help others (Eagly & Crowley, 1986) [2], and they score higher on tests assessing honesty and conscientiousness (Ones & Viswesvaran, 1998) [3]. Furthermore, women tend to hold firm positions regarding ethical values (Glover et al., 1997; Reiss & Mitra, 1998) [4], and organizations led by women experience fewer erroneous financial decisions, while economic choices are more often guided by principles of generosity and fairness (Eckel & Grossman, 1998) [5]. These findings highlight the social and economic benefits of women's leadership.

The role of women in global trade, export-import activities, and international business has received particular attention in scholarly analyses over the past decade. Reports by the OECD (2020), ILO (2022), and UNCTAD (2023) [6],[7],[8] identify the main barriers faced by women in accessing foreign markets: gender disparities in credit access, lack of integration into international networks, limited opportunities to utilize high technologies in business, and complexities in logistics, export procedures, and customs systems.

According to a study by Morgan Stanley (2023) [9], companies with gender-diverse teams achieve 7–10% higher profitability, greater innovation activity, and more sustainable management in international markets. Research based on Global Value Chains theory (Gereffi, 2019) [10] indicates that women predominantly participate in low-skilled segments of international value chains. These structural constraints exacerbate economic inequality.

In Central Asia, research on gender economics has gained momentum in recent years. The World Bank's "Women, Business and the Law" report (2022) [11] notes that significant reforms have been implemented in Uzbekistan's gender legislation. However, academic literature

consistently highlights the following issues: women's employment levels are lower compared to men; women are concentrated in lower-paid sectors; their share in leadership positions is less than 30%; the number of women in STEM fields remains very low; and women's entrepreneurship is primarily developed at the micro level.

Scientific studies in Uzbekistan indicate that increases in women's education and scientific potential lead to improvements in human capital quality, enhanced social equality, increased economic and innovative capacity [12], and greater export potential [13]. At the same time, it is emphasized that gender stereotypes, unequal distribution of household responsibilities, and limited access to financial resources significantly constrain women's economic opportunities [14].

International research indicates that low female participation in STEM fields and scientific research constrains the economy's innovative potential, as human capital is not fully utilized in scientific and technological development processes (World Bank, 2020) [15]. Furthermore, an increase in women's representation in leadership positions enhances corporate governance quality, balances strategic decision-making processes, and positively impacts companies' financial performance (World Economic Forum, 2022) [16]. Additionally, women's access to international markets accelerates economic diversification and strengthens integration into global value chains, thereby contributing to the sustainable development of the national economy (UNDP, 2020) [17]. A comprehensive review of the literature demonstrates that investments in women's intellectual potential yield multiple returns for societal welfare.

METHODOLOGY

This study was conducted using a quantitative methodological approach. The quantitative analysis aimed to assess the impact of women's economic potential on macroeconomic indicators, drawing on international experience and references from scholarly literature. The study utilized both international and national databases, including international sources, the World Bank Gender Data Portal, and UN Women statistical data.

Data for Uzbekistan were obtained from reports of the State Statistics Committee of the Republic of Uzbekistan for 2018–2024, statistics from the Ministry of Labor and Employment, state programs on gender equality (2020–2025), and the National Database on Women's Entrepreneurship. These data allowed for the assessment of women's economic activity, educational attainment, participation in STEM fields, representation in leadership positions, and role in export activities.

To provide an overall assessment of women's economic potential, the study employed an Ordinary Least Squares (OLS) model. This method enabled a comprehensive understanding of women's role in economic processes.

Econometric Analysis: Regression Model. The main objective of the study was to scientifically substantiate the economic significance of developing women's intellectual potential and to determine its impact on GDP growth. For this purpose, a linear regression model was applied.

$$GDP\_growth=\beta_0+\beta_1(FE)+\beta_2(FL)+\beta_3(FSTEM)+\beta_4(FEntrep)+\varepsilon$$

Model Variables:

In the model, GDP growth (GDP_growth) is considered the dependent variable. The explanatory, or independent, variables related to women's potential are as follows:

Female Education (FE): Level of women's education

Female Leadership (FL): Women's participation in leadership positions

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Female STEM (FSTEM): Women's potential in STEM fields
Female Entrepreneurship (FEntrep): Women's engagement in entrepreneurship
ε: The error term

During the research process, opinions from economists, gender specialists, and experts in business and export were analyzed. Expert assessments were used to fill gaps in statistical data and derive conclusions that reflect real conditions.

Limitations of the Study: Some data on women's intellectual potential in Uzbekistan are incomplete; women working in the informal sector are not fully represented in official statistics; and national statistics on STEM participation are insufficiently detailed.

Research Hypothesis: An increase in women's intellectual potential significantly enhances Uzbekistan's economic growth and international competitiveness.

RESULT

Table 1: Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Year	11	2015.455	7.421	2000	2023
GDP growth	11	5.764	1.869	1.9	8.5
Female Education	11	21.182	7.068	9	30
Female Labor Force	11	49.727	3.771	43	55
Female STEM	11	14.773	3.011	10	19
Female Entrepreneurs	11	22	5.797	13	31
Female Leadership	11	25.909	5.804	18	35
FDI inflow	11	2277.909	583.662	1285	2980
Inflation	11	13.318	5.313	8.5	28
Unemployment	11	8.764	1.025	7	10.4

This table presents the average values, standard deviations, minimum, and maximum values of economic indicators and women's potential-related variables based on 11 observations (Obs = 11).

GDP Growth: During the observation period, the average GDP growth rate was 5.764%, indicating relatively high economic growth rates. However, the standard deviation of 1.869 suggests that growth rates fluctuated significantly over the years, ranging from a minimum of 1.9% to a maximum of 8.5%.

Inflation: The average inflation rate was 13.318%, indicating a high level of price instability in the economy. The standard deviation of 5.313 shows that inflation fluctuated widely, ranging from 8.5% to 28%.

Unemployment: The average unemployment rate was 8.764%, with a relatively stable standard deviation of 1.025, ranging from 7% to 10.4%.

FLF (Female Labor Force Participation): Women's participation in the labor market averaged around 49.73%.

FL (Female Leadership): The share of women in leadership positions averaged 25.91%. The study highlights that having less than 30% representation of women in leadership positions remains a pressing issue.

FSTEM (Women in STEM fields): This indicator averaged 14.77%, ranging from a minimum of 10% to a maximum of 19%. The study notes that such a low share limits the economy's innovative potential.

FEntrep (Female Entrepreneurship): The level of women's entrepreneurship averaged 22%.

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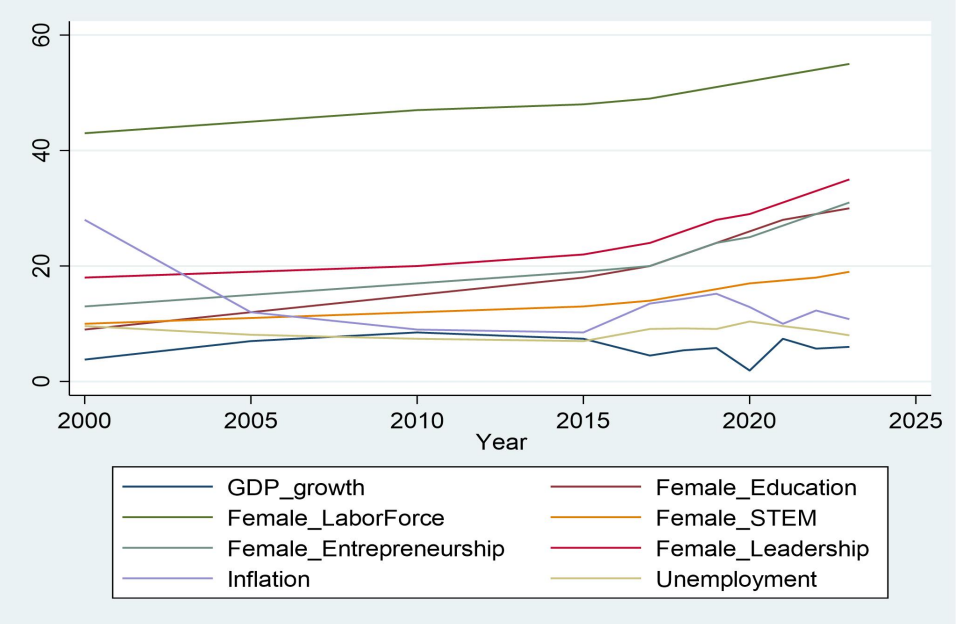
Descriptive statistics show that, on one hand, the country's economy exhibits relatively high average GDP growth. On the other hand, women's contribution to key economic indicators—particularly in STEM fields and leadership positions—remains low, confirming the presence of "significant underutilized economic potential.

Table 2: Time series line



The graph illustrates the dynamics over time of GDP growth, women's education level, labor market participation, share in STEM fields, entrepreneurship, leadership representation, as well as inflation and unemployment rates.

Female Labor Force Participation: The graph shows that women's participation in the labor market has been stable and exhibited a consistent upward trend. In the 2000s, the indicator was around 43–45%, increasing to over 55% by 2024. This reflects the effectiveness of institutional reforms in Uzbekistan aimed at increasing female employment.

Female Education: Women's education level has demonstrated steady and accelerating growth throughout the period. In particular, growth rates have strengthened after 2015.

Female Leadership: The share of women in leadership positions has gradually but steadily increased since the 2000s, with a notable surge observed particularly after 2018.

Female Entrepreneurship: Women's entrepreneurship also shows an upward trend, although at relatively slow growth rates. This indicates that women's business activity largely remains within micro and small business segments.

Women in STEM: Growth in STEM participation has been the slowest and remains low. Between 2000 and 2024, the indicator fluctuated only within the 8–18% range.

GDP Growth: GDP growth has experienced unstable fluctuations over the years, with a sharp decline in 2020 due to the pandemic, followed by a subsequent recovery.

Inflation and Unemployment: Inflation has exhibited high volatility, negatively affecting economic stability. Unemployment remains relatively low and stable; however, challenges related to the quality of women's employment persist.

Graphical analysis indicates that women's intellectual and economic potential in Uzbekistan has been quantitatively increasing. Nevertheless, their impact on economic growth is not yet sufficient in qualitative and structural terms. In particular, the low participation of women in STEM and high value-added sectors prevents a fully positive effect on GDP growth.

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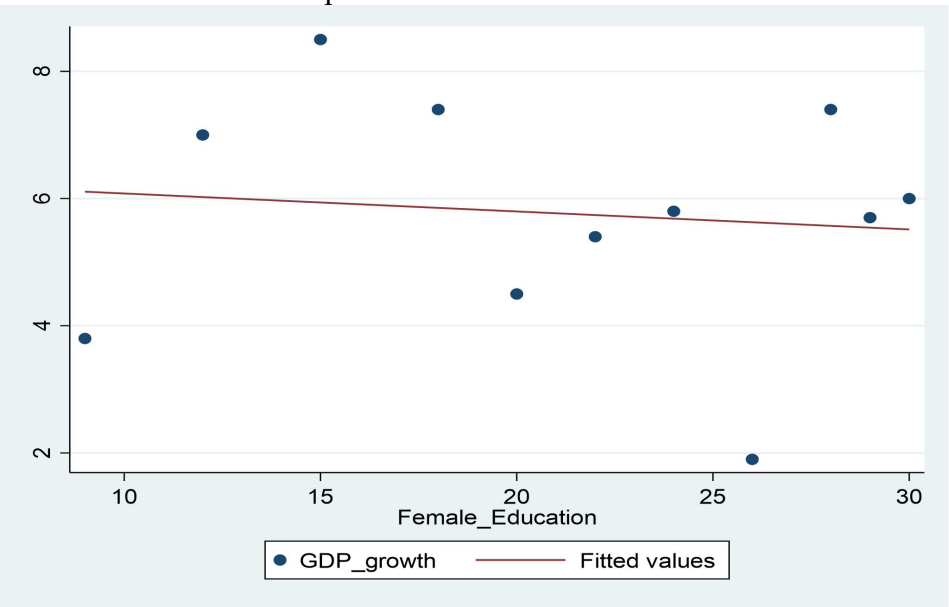
Table 3: The Relationship between Women's Education Level and GDP Growth.

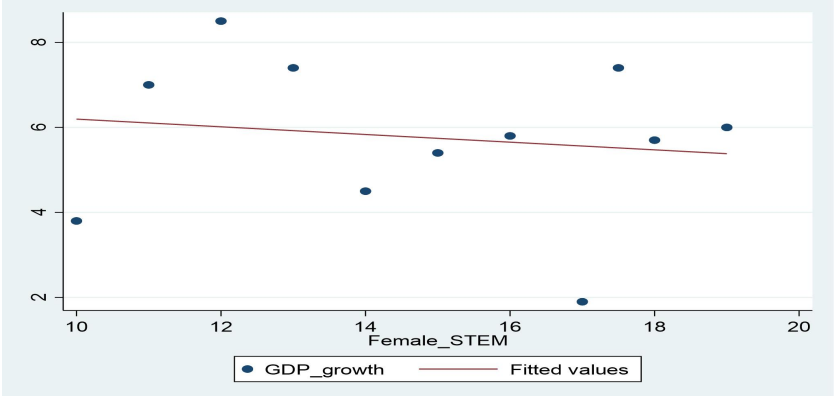


The following figure illustrates the relationship between women's education level and GDP growth. Female education is plotted on the horizontal axis, while GDP growth is on the vertical axis. The points represent yearly observations, and the straight line indicates fitted values based on the regression.

The graph shows a slightly downward-sloping (negative) regression line. This indicates that increases in women's education do not lead to an immediate and direct increase in GDP growth. However, the negative slope is not strong, suggesting a weak correlation between women's education and economic growth.

The points are widely scattered around the regression line, indicating that women's education alone cannot explain GDP growth. Other factors, such as inflation, external shocks, investments, and the pandemic, have a strong influence on GDP growth. This graph demonstrates that an increase in women's education has not had a significant short-term positive effect on GDP growth. However, this does not imply that the economic significance of women's education is low; rather, its impact emerges over the long term and in interaction with other factors.

Table 4: The Relationship between Women's Share in STEM Fields and GDP Growth



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In this scatter-plot, women's share in STEM fields is represented on the horizontal axis, while GDP growth is shown on the vertical axis. The points correspond to yearly observations, and the regression line reflects the average relationship between the variables.

The main trend observed from the graph is a downward-sloping (negative) regression line, indicating that during periods when women's participation in STEM increased, GDP growth did not immediately or directly rise. The negative trend does not imply that women's participation in STEM has a harmful effect on economic growth; rather, it suggests that the economic impact of this factor emerges with a delay.

The points are widely scattered around the regression line, indicating that the Female_STEM indicator alone cannot explain GDP growth. External factors such as foreign trade, investments, inflation, the pandemic, and institutional conditions have a strong influence on economic growth.

According to human capital and innovation growth theories, investments in STEM fields affect GDP growth indirectly and over the long term. The short-term negative relationship observed in the graph suggests that Uzbekistan's economy has not yet fully utilized women's STEM potential. Moreover, the graph shows that there is no strong short-term positive correlation between the increase in women's STEM participation and GDP growth. This does not imply that the economic significance of women's STEM potential is low; rather, it indicates that its impact is closely linked to institutional conditions and the time factor.

TABLE 5. Linear regression

GDP_growth	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
FE	.662	1.179	0.56	.595	-2.222	3.546	
FLF	1.589	1.963	0.81	.449	-3.214	6.392	
FSTEAM	-6.215	2.521	-2.47	.049	-12.382	-.047	**
FEntrep	1.359	.99	1.37	.219	-1.064	3.783	
Constant	-25.37	79.198	-0.32	.76	-219.161	168.422	

Mean dependent var	5.764	SD dependent var	1.869
R-squared	0.646	Number of obs	11
F-test	2.734	Prob > F	0.131
Akaike crit. (AIC)	42.517	Bayesian crit. (BIC)	44.507

*** $p<.01$, ** $p<.05$, * $p<.1$

According to the regression results, the model's R^2 is 0.646, indicating that the selected independent variables explain 64.6% of the variation in GDP growth. This suggests that indicators related to women's potential are significantly associated with macroeconomic growth.

The F-test value is F = 2.734 (Prob > F = 0.131), showing that the model is partially statistically significant at the 10% confidence level. The small number of observations (n = 11) affected this result.

The coefficient for Female Education is 0.662 and positive, but statistically insignificant (p = 0.595). This implies that increases in women's education have a positive effect on economic growth, although the impact is not observable in the short term. According to human capital theory, the economic benefits of education manifest over the long term.

The coefficient for Female Labor Force Participation is 1.589 and positive, but also statistically insignificant (p = 0.449). This indicates that although women's employment is increasing, a large portion of them remain employed in low-productivity and low-income sectors.

The coefficient for women's share in STEM fields is −6.215 and statistically significant at the 5% level (p = 0.049). This result indicates that during periods when women's participation in STEM increased, GDP growth temporarily declined. However, this negative relationship can be explained by several factors: the number of women in STEM is still insufficient; women are primarily employed in lower segments of STEM; and there is a lag effect between innovations and economic growth. Therefore, this result does not imply that women's STEM potential is economically insignificant, but rather highlights the existence of structural constraints.

The coefficient for female entrepreneurship is 1.359, showing a positive effect, but it is not statistically significant (p = 0.219). This suggests that while women's entrepreneurship has a positive impact on GDP growth, it largely remains at the micro and small business level.

The constant term in the model is −25.37 and is not statistically significant. This indicates that there are other macroeconomic factors not included in the model, such as inflation, FDI, and foreign trade. The model results suggest that the impact of women's intellectual potential on economic growth is not direct, but manifests indirectly and over the long term. In particular, the negative yet significant coefficient for women's participation in STEM indicates that Uzbekistan has not fully utilized women's innovation potential.

The findings demonstrate that the effect of women's intellectual potential on economic growth is complex and multi-stage. Factors such as education, employment, and entrepreneurship influence economic growth indirectly and over a long horizon. The negative coefficient for STEM participation confirms that in terms of gender equality, quality matters more than quantity.

These results align with studies by the World Bank, OECD, and UNCTAD, indicating that unless women's participation in economic processes is enhanced, the existing potential will not be fully realized.

DISCUSSION

The findings of this study indicate that women's intellectual and economic potential plays a significant, albeit indirect, role in Uzbekistan's economic growth and international competitiveness. Empirical and econometric analyses reveal that women's education, labor market participation, entrepreneurial activity, and involvement in STEM fields are positively associated with macroeconomic indicators, though the effects often manifest with a time lag. The regression model ($R^2 = 0.646$) confirms that women's potential accounts for a substantial portion of GDP variation.

Despite quantitative growth in women's participation in economic processes, qualitative aspects remain insufficient. In particular, the negative and statistically significant coefficient for women's share in STEM highlights that their innovation potential is not yet fully harnessed. These findings suggest that while progress has been made, structural, institutional, and cultural barriers continue to limit the effective utilization of women's skills and knowledge.

Furthermore, descriptive and graphical analyses underscore the need to improve the quality of women's employment, leadership representation, and entrepreneurship orientation toward international markets. The study demonstrates that leveraging women's intellectual potential is a strategic priority for fostering sustainable economic development, innovation, and competitiveness in Uzbekistan.

CONCLUSION

This study scientifically confirms that the development of women's intellectual and economic potential is crucial for promoting economic growth and enhancing Uzbekistan's international competitiveness. Key findings include:

Women's education and labor force participation positively contribute to macroeconomic performance, though impacts appear with a time lag. Women's participation in STEM and innovation-related fields remains underutilized, limiting potential economic gains. Structural and cultural barriers continue to constrain women's full economic engagement.

Based on these findings, practical policy recommendations are proposed:

Strengthen education and STEM programs for women, including scholarships, grants, quotas, and research funding. Enhance employment quality through retraining, upskilling, and flexible work arrangements. Promote female leadership in government and corporate sectors through training, quotas, and gender-balanced governance incentives. Expand women's entrepreneurship toward exports with mentoring, consulting, and access to international funding. Reduce institutional and cultural barriers via awareness campaigns, equitable household policies, and improved gender statistics.

Investments in women's intellectual potential should be viewed as long-term strategic resources that significantly enhance sustainable economic growth, innovation, and global competitiveness.

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