

# Service Quality, Waiting Time, and Healthcare Facilities Predict Patient Satisfaction: Evidence from North Jakarta Workers' General Hospital

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## ABSTRACT

Patient satisfaction is an important indicator of outpatient service performance. This study examined the effects of service quality and waiting time on patient satisfaction, with healthcare facilities as a moderating variable, at North Jakarta Workers' General Hospital. A quantitative cross-sectional survey was conducted among 96 outpatients selected through simple random sampling. Data were collected using a structured questionnaire and analyzed using Partial Least Squares-Structural Equation Modelling. The results showed that service quality had a positive and significant effect on patient satisfaction, with a path coefficient of 0.349 and a p-value of 0.002. Waiting time also had a positive and significant effect on patient satisfaction, with a path coefficient of 0.409 and a p-value below 0.001, indicating that better service timeliness and efficiency were associated with higher satisfaction. Healthcare facilities had a positive and significant direct effect on patient satisfaction, with a path coefficient of 0.256 and a p-value of 0.004. In the moderation model, healthcare facilities weakened the relationship between service quality and patient satisfaction, with a path coefficient of -0.220 and a p-value of 0.039, but strengthened the relationship between waiting time and patient satisfaction, with a path coefficient of 0.270 and a p-value of 0.006. These findings indicate that patient satisfaction is influenced not only by service quality and service timeliness but also by healthcare facilities and their interaction with core service variables. Hospitals should therefore prioritize integrated improvements in service quality, timeliness of care, and facility support to enhance outpatient satisfaction.



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## 1. Introduction

Patient satisfaction is a central indicator of hospital service performance because it reflects the extent to which healthcare delivery meets patient expectations and needs. In outpatient services, satisfaction is particularly important because patients directly experience administrative procedures, service interactions, service timeliness, and the

physical care environment during a relatively short encounter [1],[2],[3],[4]. Higher patient satisfaction is associated with greater trust in healthcare providers, stronger intention to return, and more positive recommendations, whereas dissatisfaction may reduce service utilization and weaken the hospital's public image [2],[3],[4],[5].

Among the factors that shape outpatient satisfaction, service quality remains one of the most consistently discussed determinants. In healthcare, service quality is reflected in reliability, responsiveness, assurance, empathy, and tangible aspects of service delivery. Better service quality tends to generate more favorable patient evaluations because patients value accurate care, responsive staff, clear communication, and supportive service experiences [2],[5]. In outpatient settings, these dimensions are highly visible because patients evaluate not only the clinical encounter but also the overall service process from registration to consultation.

Waiting time is another important factor influencing outpatient satisfaction. According to Indonesia's Minimum Service Standards for hospitals, outpatient waiting time should not exceed 60 minutes [6]. However, waiting time remains a frequent source of patient complaints in many healthcare facilities. Poorly managed waiting processes may create discomfort, frustration, and negative perceptions of service efficiency, whereas timely and well-organized service delivery may improve patient evaluations of care [7],[8]. In this study, the waiting time construct refers to service timeliness and punctuality, including punctual service delivery and appointment accuracy, so that higher scores reflect more efficient service rather than longer delays. This clarification is important to avoid misinterpretation, because in this study Waiting Time refers to service timeliness and punctuality rather than the duration of delay.

In addition to service quality and waiting time, healthcare facilities may also influence patient satisfaction. Healthcare facilities include physical and environmental aspects that support service delivery, such as cleanliness, availability of medical equipment, waiting room comfort, parking areas, and interior conditions [9], [10]. Adequate facilities can enhance patient comfort and strengthen favorable perceptions of the care experience. Previous studies also suggest that healthcare facilities may function not only as a direct predictor of satisfaction but also as a contextual factor that changes how patients evaluate the effects of core service variables, including service quality and waiting time [11],[12].

Patient satisfaction is also affected by broader service management conditions. Clear procedures, inter-unit coordination, and staff competence support timely and accurate services while minimizing delays that may disrupt patient flow [13], [14]. In addition, patient perceptions may vary according to prior experiences and personal characteristics, meaning that the same level of service may not be interpreted identically by all individuals [15],[16]. These considerations indicate that outpatient satisfaction should be examined through an integrated framework that includes both direct service variables and contextual support factors.

Although previous studies have widely examined the relationships between service quality, waiting time, and patient satisfaction, most have focused mainly on direct effects. Research that positions healthcare facilities as a moderating variable in this relationship remains relatively limited [17]. This gap is important because healthcare facilities may alter how strongly patients translate service quality and service timeliness into overall satisfaction. Therefore, this study analyzes the effects of service quality and waiting time on patient satisfaction, with healthcare facilities as a moderating variable, at North Jakarta Workers' General Hospital. The findings are expected to contribute to

hospital service management, particularly in improving service quality, strengthening service timeliness, and optimizing healthcare facilities to enhance outpatient satisfaction.

Based on the proposed model, this study hypothesizes that service quality positively affects patient satisfaction, waiting time positively affects patient satisfaction, and healthcare facilities positively affect patient satisfaction. In addition, healthcare facilities are expected to moderate the relationship between service quality and patient satisfaction, as well as the relationship between waiting time and patient satisfaction.

## **2. Methods**

### **Study Design and Setting**

This study employed an explanatory quantitative approach with a non-experimental cross-sectional design. The study was conducted over a period of three months at North Jakarta Workers' General Hospital. A cross-sectional design was considered appropriate because the study aimed to examine the relationships among Service Quality, Waiting Time, Healthcare Facilities, and Patient Satisfaction at a single point in time.

### **Population, Sampling, and Sample Size**

The study population consisted of all outpatients receiving services in general and specialist clinics at North Jakarta Workers' General Hospital during the data collection period. A simple random sampling technique was applied to ensure that each eligible patient had an equal probability of being selected. Patients who met the inclusion criteria during the data collection period were assigned sequential numbers, and a computerized randomization process was then used to select respondents. This procedure was used because the outpatient population was dynamic and varied daily.

The sample size was determined using the Lemeshow formula because the outpatient population was not known with certainty and was dynamic. Using a confidence level of 95% ( $z = 1.96$ ), a proportion of  $p = 0.5$ , and a margin of error of 10% ( $d = 0.1$ ), the minimum required sample was 96 respondents. Accordingly, the final analysis included 96 outpatients.

### **Research Instrument and Variable Measurement**

Primary data were collected using a structured questionnaire developed from four study constructs, namely Service Quality, Waiting Time, Healthcare Facilities, and Patient Satisfaction. The instrument consisted of five indicators for Service Quality, four indicators for Waiting Time, five indicators for Healthcare Facilities, and four indicators for Patient Satisfaction, consistent with the measurement model reported in the Results and Discussion section.

Service Quality was measured through reliability, responsiveness, assurance, empathy, and tangibles, in line with previous studies on healthcare service quality and patient satisfaction [2],[5]. Waiting Time in this study was operationalized as service timeliness and punctuality, including punctuality of opening and closing times, punctuality of service delivery, punctuality of health personnel attendance, and punctuality of appointments. Therefore, higher scores on this construct reflected better time efficiency and more punctual service, rather than longer delays [6],[7],[8]. Patient Satisfaction was measured through satisfaction with services, service quality, service processes, and the health service system, whereas Healthcare Facilities were measured through facility completeness, cleanliness, interior design, parking availability, and waiting room comfort [9],[10],[11],[12].

All questionnaire items were rated using a 5-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. In the PLS-SEM analysis, the item responses were

treated as reflective indicators, and the latent construct scores were estimated through the SmartPLS 4 model rather than by simple summation.

#### Data Collection Procedure

The questionnaire was administered both in person and through Google Forms, with the online link distributed via WhatsApp to patients attending outpatient clinics. Before analysis, all returned questionnaires were screened for completeness, and only complete questionnaires were included in the final analysis.

#### Data Analysis

Data were analyzed using Partial Least Squares–Structural Equation Modelling (PLS-SEM) with the assistance of SmartPLS 4. Model evaluation was conducted in two stages, namely outer model evaluation and inner model evaluation. The outer model was assessed through convergent validity using outer loading values, with indicators considered acceptable when the loading exceeded 0.70. Reliability and construct validity were evaluated using Cronbach’s Alpha, Composite Reliability, and Average Variance Extracted (AVE), with minimum criteria of 0.70 for reliability and 0.50 for AVE.

The inner model was evaluated using the coefficient of determination and hypothesis testing through the bootstrapping procedure. A relationship was considered statistically significant when the t-statistic exceeded 1.96 and the p-value was less than 0.05.

#### Ethical Considerations

This study involved human participants in the form of outpatients. Formal ethical approval was not obtained for this study. However, permission to conduct the research was obtained from the hospital management prior to data collection. All respondents provided informed consent before completing the questionnaire, and the confidentiality and anonymity of respondent data were strictly maintained.

### 3. Results and Discussion

#### Respondent Characteristics

This study involved 96 outpatients at North Jakarta Workers’ General Hospital. Respondent characteristics were presented to describe the sample profile based on demographic background and outpatient service unit. As shown in **Table 1**, female respondents accounted for the majority of the sample, with 67 respondents (70%), while male respondents numbered 29 (30%). In terms of age, the largest group was 28–32 years, comprising 24 respondents (25%), followed by 18–22 years with 21 respondents (22%), 23–27 years with 20 respondents (21%), more than 40 years with 17 respondents (18%), and 33–40 years with 14 respondents (14%). This distribution indicates that the respondents were predominantly within the productive age range, which is relevant because patients in this age group tend to be more attentive to service efficiency and the overall outpatient care experience [15],[16].

**Table 1.** Demographic Characteristics of Respondents

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	29	30
	Female	67	70
Age (years)	18–22	21	22
	23–27	20	21
	28–32	24	25
	33–40	14	14
	>40	17	18
	Total	96	100

The distribution of respondents across polyclinic service units is presented in **Table 2**. The Tulip Executive clinic contributed the largest proportion, with 16 respondents (16.7%), while each of the other specialist clinics contributed 5 respondents (5.2%). This pattern indicates that the sample was drawn from a broad range of outpatient services, thereby providing a sufficiently diverse representation of hospital service experiences. Such variation is important because patient perceptions of service quality, timeliness, and healthcare facilities may differ across service units with different operational characteristics and patient flow patterns.

**Table 2.** Distribution of Respondents by Polyclinic Service Unit

Polyclinic Service Unit	Frequency (n)	Percentage (%)
Tulip Executive	16	16.7
Pediatrics	5	5.2
Surgery	5	5.2
Physiotherapy	5	5.2
Conservative Dentistry	5	5.2
Cardiology	5	5.2
Obstetrics and Gynecology	5	5.2
Psychology	5	5.2
Dermatology and Venereology	5	5.2
Ophthalmology	5	5.2
Orthopedics	5	5.2
Pulmonology	5	5.2
Internal Medicine	5	5.2
Medical Rehabilitation	5	5.2
Neurology	5	5.2
Otorhinolaryngology (ENT)	5	5.2
Urology	5	5.2
Total	96	100

### Measurement Model Evaluation

The outer model was evaluated to examine whether the indicators used in this study were valid and reliable in representing their respective latent constructs. In PLS-SEM, outer model assessment is essential before interpreting the structural relationships, because the quality of the measurement model determines the credibility of the subsequent inner model results. In the present study, outer model evaluation covered convergent validity, reliability and construct validity, and discriminant validity assessment based on the SmartPLS 4 output presented in **Table 3**, **Table 4**, and **Table 5**. The criteria applied in this study followed the thresholds described in the method section, namely outer loading values above 0.70, reliability coefficients above 0.70, and AVE values above 0.50.

#### Convergent Validity

Convergent validity was assessed using outer loading values, with indicators considered acceptable when the loading exceeded 0.70. As presented in **Table 3**, all indicators for Service Quality, Waiting Time, Patient Satisfaction, and Healthcare Facilities had outer loading values above the minimum threshold, indicating that all indicators contributed adequately to their respective constructs and therefore did not require elimination. The Service Quality indicators ranged from 0.910 to 0.974, the Waiting Time indicators ranged from 0.914 to 0.984, the Patient Satisfaction indicators ranged from 0.952 to 0.980, and the Healthcare Facilities indicators ranged from 0.927 to 0.981. In addition, the two interaction terms each showed a loading of 1.000. These

results confirm that the indicators used in this study met the statistical requirement for convergent validity and were able to explain their latent variables appropriately [18].

**Table 3.** Outer Loadings of Measurement Indicators

Construct	Indicator	Outer loading
Service Quality	SQ1	0.974
Service Quality	SQ2	0.938
Service Quality	SQ3	0.910
Service Quality	SQ4	0.953
Service Quality	SQ5	0.926
Waiting Time	WT1	0.984
Waiting Time	WT2	0.914
Waiting Time	WT3	0.954
Waiting Time	WT4	0.965
Patient Satisfaction	PS1	0.980
Patient Satisfaction	PS2	0.952
Patient Satisfaction	PS3	0.969
Patient Satisfaction	PS4	0.975
Healthcare Facilities	HF1	0.981
Healthcare Facilities	HF2	0.961
Healthcare Facilities	HF3	0.927
Healthcare Facilities	HF4	0.977
Healthcare Facilities	HF5	0.927
Service Quality × Healthcare Facilities	Interaction term	1.000
Waiting Time × Healthcare Facilities	Interaction term	1.000

Source: Data processed by researchers using SmartPLS 4.

Note: All indicators showed outer loading values above 0.70.

Several indicators, particularly in the Patient Satisfaction and Healthcare Facilities constructs, showed very high loading values above 0.90. This pattern suggests strong consistency between indicators and constructs, indicating that the measurement model performed very well in capturing the intended latent variables. However, the interpretation of these very high loading values should remain cautious. Repeatedly high loading values may also indicate that some items are highly similar in wording or meaning, thereby suggesting possible item redundancy rather than broad multidimensional construct representation. Because all responses were collected from the same respondents at one point in time, this pattern may also reflect potential common method variance (CMV). Therefore, although the convergent validity results are statistically strong, future studies are encouraged to complement this analysis with HTMT and VIF assessment to further confirm construct distinctiveness and model stability.

#### Reliability and Construct Validity

Reliability and construct validity were evaluated using Cronbach's Alpha, rho<sub>a</sub>, rho<sub>c</sub>, and Average Variance Extracted (AVE). As shown in **Table 4**, all constructs demonstrated very high reliability values. Cronbach's Alpha ranged from 0.967 to 0.978, rho<sub>a</sub> ranged from 0.968 to 0.979, rho<sub>c</sub> ranged from 0.975 to 0.984, and all AVE values ranged from 0.885 to 0.939. Specifically, Healthcare Facilities had Cronbach's Alpha of 0.976, rho<sub>a</sub> of 0.979, rho<sub>c</sub> of 0.981, and AVE of 0.912; Patient Satisfaction had 0.978, 0.979, 0.984, and 0.939; Service Quality had 0.967, 0.969, 0.975, and 0.885; and Waiting Time had 0.967, 0.968, 0.976, and 0.911. These findings indicate that all constructs

satisfied the reliability and construct validity criteria and were suitable for further structural model testing [19].

**Table 4.** Reliability and Construct Validity

<b>Construct</b>	<b>Cronbach's Alpha</b>	<b>rho_a</b>	<b>rho_c</b>	<b>AVE</b>
Healthcare Facilities	0.976	0.979	0.981	0.912
Patient Satisfaction	0.978	0.979	0.984	0.939
Service Quality	0.967	0.969	0.975	0.885
Waiting Time	0.967	0.968	0.976	0.911

Source: Data processed by researchers using SmartPLS 4.

Note: Cronbach's Alpha, rho\_a, and rho\_c values above 0.70 indicate acceptable reliability, while AVE values above 0.50 indicate adequate construct validity.

At the same time, the interpretation of these reliability values should not rely only on the notion of "excellent reliability." Extremely high reliability coefficients may also suggest that the indicators are highly homogeneous and potentially repetitive in meaning. Thus, although the instrument clearly satisfies the formal statistical criteria for reliability and construct validity, the results should still be interpreted with awareness that very high consistency can also reflect limited diversity of item content. This is especially relevant in self-report survey data collected from a single source within the same measurement occasion.

**Discriminant Validity Assessment**

Discriminant validity refers to the extent to which a construct is empirically distinct from other constructs in the model. In the present study, the available output is presented in **Table 5**, which contains the inter-construct correlation matrix for the main variables and the interaction terms. The correlations among the core constructs ranged from 0.664 to 0.864, while the interaction terms showed lower correlations with the main constructs, except for the correlation between the two interaction terms, which reached 0.878. Substantively, these values suggest that the constructs of Service Quality, Waiting Time, Patient Satisfaction, and Healthcare Facilities remain conceptually distinguishable, although they are logically related within the outpatient service context [12].

**Table 5.** Inter-Construct Correlation Matrix for Preliminary Discriminant Validity Assessment

<b>Construct</b>	<b>Waiting Time</b>	<b>Service Quality</b>	<b>Patient Satisfaction</b>	<b>Healthcare Facilities</b>	<b>Healthcare Facilities × Service Quality</b>	<b>Healthcare Facilities × Waiting Time</b>
Waiting Time	–					
Service Quality	0.777	–				
Patient Satisfaction	0.864	0.700	–			
Healthcare Facilities	0.790	0.664	0.860	–		
Healthcare Facilities × Service Quality	0.363	0.172	0.391	0.502	–	

Healthcare Facilities × Waiting Time	0.442	0.322	0.465	0.475	0.878	—
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Source: Data processed by researchers using SmartPLS 4.

Note: This table presents inter-construct correlations as a preliminary assessment of construct separation. For standard PLS-SEM reporting, discriminant validity should preferably be confirmed using Fornell–Larcker and/or HTMT.

Nevertheless, this part should be interpreted more cautiously than the previous two subsections. The current output is closer to an inter-construct correlation matrix than to a standard PLS-SEM discriminant validity report. Therefore, while the present table may still serve as a preliminary assessment of construct separation, it should not be presented as a definitive discriminant validity test. For stronger methodological reporting, the final manuscript would ideally include Fornell–Larcker and/or HTMT, accompanied by the relevant cut-off values. Accordingly, the current results should be interpreted as preliminary evidence that the constructs are distinguishable, rather than as conclusive proof of discriminant validity.

### Structural Model Evaluation Coefficient of Determination

The coefficient of determination was used to assess the extent to which the independent and moderating variables explained variation in patient satisfaction. The structural model produced an R-square value of 0.995 and an Adjusted R-square value of 0.994 for patient satisfaction, indicating that the model explained a very large proportion of the variance in the dependent variable. In other words, service quality, waiting time, healthcare facilities, and the two moderating interaction terms jointly accounted for 99.5% of the variance in patient satisfaction, while the remaining 0.5% may be associated with factors outside the model [20].

Although this result indicates very high explanatory power, its interpretation must remain cautious. An R-square value of this magnitude should be interpreted cautiously because it is unusually high for survey-based behavioural and service research and may be influenced by homogeneity of respondent perceptions, similarity among measurement items, and the use of self-reported data collected at a single point in time. Therefore, the model may be considered highly explanatory within the present dataset, but future studies should incorporate broader variables, additional institutions, and more diverse data sources to confirm the robustness of the model's predictive performance.

### Hypothesis Testing: Direct and Moderating Effects

Hypothesis testing was conducted using the bootstrapping procedure in SmartPLS 4, with significance determined when the t-statistic exceeded 1.96 and the p-value was below 0.05. The results of the structural relationships are presented in **Table 6**. Overall, all proposed paths were statistically significant, including the direct effects of service quality, waiting time, and healthcare facilities on patient satisfaction, as well as the two moderating effects of healthcare facilities.

Service quality showed a positive and significant effect on patient satisfaction, with a path coefficient of 0.349 and a p-value of 0.002. This indicates that better service quality was associated with higher patient satisfaction. This finding is consistent with previous studies showing that reliability, responsiveness, assurance, empathy, and tangible aspects of healthcare service are central determinants of outpatient satisfaction [2],[5].

**Table 6.** Path Coefficients and Hypothesis Testing Results

Relationship	Path coefficient	Standard deviation	T-statistic	P-value	Decision
Service Quality → Patient Satisfaction	0.349	0.111	3.134	0.002	Significant
Waiting Time → Patient Satisfaction	0.409	0.114	3.587	<0.001	Significant
Healthcare Facilities → Patient Satisfaction	0.256	0.089	2.883	0.004	Significant
Healthcare Facilities × Service Quality → Patient Satisfaction	-0.220	0.106	2.063	0.039	Significant (Moderation)
Healthcare Facilities × Waiting Time → Patient Satisfaction	0.270	0.099	2.730	0.006	Significant (Moderation)

Source: Data processed by researchers using SmartPLS 4.

Waiting time also showed a positive and significant effect on patient satisfaction, with a path coefficient of 0.409 and a p-value below 0.001. This result should not be interpreted as meaning that longer waiting increases satisfaction. In the present study, the waiting time construct reflected service timeliness and punctuality, including punctual service delivery and appointment accuracy. Therefore, the positive coefficient indicates that better time efficiency and more punctual service were associated with higher patient satisfaction. This clarification is important to avoid misinterpretation, because in this study Waiting Time reflects service timeliness and punctuality rather than prolonged delay [6],[7],[17],[18].

Healthcare facilities also had a positive and significant direct effect on patient satisfaction, with a path coefficient of 0.256 and a p-value of 0.004. This suggests that better facilities, including cleanliness, equipment availability, waiting room comfort, parking, and supporting physical infrastructure, contributed positively to patients' evaluations of outpatient services. This finding supports earlier studies emphasizing that facility conditions are not merely complementary but form an important component of patient experience and satisfaction [9],[10],[11].

The moderating effect of healthcare facilities on the relationship between service quality and patient satisfaction was significant and negative, with a path coefficient of -0.220 and a p-value of 0.039. This means that when healthcare facilities were already perceived as very good, the incremental contribution of service quality to satisfaction became relatively smaller. One possible interpretation is that high-quality facilities may partially absorb or compensate for some service-related expectations, thereby weakening the marginal impact of perceived service quality on overall satisfaction [11], [12].

By contrast, the moderating effect of healthcare facilities on the relationship between waiting time and patient satisfaction was positive and significant, with a path coefficient of 0.270 and a p-value of 0.006. This indicates that better healthcare facilities strengthened the positive influence of service timeliness on patient satisfaction. In practical terms, efficient service time may be experienced more favorably when it is

supported by adequate physical facilities, comfortable waiting spaces, and a supportive outpatient environment. Thus, healthcare facilities played a dual role in this study, acting both as a direct predictor of patient satisfaction and as a contextual factor that altered the strength of the relationships between core service variables and patient satisfaction [11],[12].

#### **Limitations of the Study**

This study has several limitations that should be considered when interpreting the findings. First, the data were collected from a single hospital setting, namely North Jakarta Workers' General Hospital, which may limit the generalizability of the results to other healthcare institutions with different service systems and patient characteristics. Second, the study relied on self-reported questionnaires, which may introduce subjective bias because responses were based on personal perceptions at the time of data collection. Third, the cross-sectional design captured patient satisfaction at only one point in time and therefore supports associations rather than strong causal inferences. Fourth, although the model explained a high proportion of variance in patient satisfaction, other potentially relevant factors, such as staff behavior, treatment outcomes, administrative efficiency, and organizational processes, were not included in the present analysis. Future studies are therefore recommended to involve multiple healthcare institutions, incorporate additional explanatory variables, and use more diverse data sources or longitudinal designs to obtain more comprehensive and robust findings.

#### **4. Conclusion**

This study concludes that service quality, waiting time, and healthcare facilities were significantly associated with Patient Satisfaction among outpatients at North Jakarta Workers' General Hospital. Better service quality, more efficient and punctual service delivery, and more adequate healthcare facilities were all linked to higher patient satisfaction, while Healthcare Facilities also acted as a moderating variable by weakening the relationship between service quality and patient satisfaction and strengthening the relationship between service timeliness and patient satisfaction. These findings indicate that outpatient satisfaction is shaped not only by core service performance but also by the supporting physical environment, implying that hospitals should prioritize integrated improvements in service quality, timeliness of care, and facility support. However, because this study used a cross-sectional design, the findings should be interpreted as evidence of association rather than strong causal relationships, and future studies should involve broader healthcare settings and additional explanatory variables to obtain more comprehensive evidence.

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#### **Conflict of Interest:**

The authors declare that there are no conflicts of interest related to the publication of this article.

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