Structural Equation Model in Patient Satisfaction of Service Quality in Hospital

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ABSTRACT:

INTRODUCTION:

Patient satisfaction is a widely utilized and significant indicator in assessing the quality of health care services because patients play contributor, goal, and reforming roles in quality assurance. Patient satisfaction survey results enable health care professionals to identify service elements that need to be improved. The purpose of this paper is to examine the patient satisfaction by assessing in five dimensions of service quality (SERVQUAL); tangible, empathy, assurance, reliability, and responsiveness in one private hospital of Padang city, Indonesia.

METHODS:

The five dimensions- SERVQUAL model (tangible, empathy, assurance, reliability, and responsiveness) was implemented to measure of patient satisfaction. Data were collected using a sample of 49 patients and it was analysed using SPSS and Smart-PLS. The measurement model was analysed using composite reliability, convergent and discriminate validity while the structural model was used to predict the relationships between variables.

RESULTS:

The SERVQUAL tool proved to be reliable and valid in assessing service quality in X Surgical Hospital. The results indicated that all factors (tangible, empathy, assurance, and responsiveness) except reliability as a place have a significant and positive impact on the overall patient's satisfaction. All indicator emphasis relation with service quality, except reliability (0,403).

CONCLUSIONS:

Overall, users are satisfied with service provided in this hospital even though reliability dimension proof to be un expected to fulfil the patient expectation.

KEYWORDS: Hospital, Patient, Satisfactions, SEM-PLS, Service Quality

1. INTRODUCTION

In light of an aging population, rising consumerism, increased competitive pressures, and innovative therapies and technology, healthcare is one of the fastest-growing industries in the service economy, making innovation even more crucial (James, Villacis Calderon and Cook, 2017). Compare to years ago, quality of care was primarily framed on what is delivered rather that what is needed by the customer (Upadhyai *et al.*, 2020). But today, instead of just capability in medical knowledge, facilities, equipment, administrative and professional qualification are more valuable from some patient. Health-care organizations nowadays having increasing awareness about affecting their public image and how to sustain the profit (Upadhyai *et al.*, 2020; AlOmari, 2021). Meanwhile, the concept of quality seems vary in definition and understanding. Based on Joran's definition quality are incorporated between specification and customer satisfaction (Endeshaw, 2021).

The unique features of healthcare, such as intangibility, diversity, and simultaneous actions, make it complicated to determine and assess quality, as do the complex nature of healthcare, the diverse interests of healthcare providers in providing healthcare services, and the requirement of ethical considerations when confronted with a problem. It was also said that service supply for a patient differs due to differences in background, experience, skills, and personal qualities of healthcare workers (Ladhari, 2009; Endeshaw, 2021).

Service quality is one of the crucial factors to get benefit in this competition with make the differences and to obtain superiority between hospital (Altuntas, Dereli and Yilmaz, 2012). It's defined as desired degree of perfection and manage over that perfection to maximize client need since its implication that excellent or horrific quality service relies upon the capacity pf service providers to continually meet costumer expectation (Apfiasari and Rimawa, 2023). Patient satisfaction survey results assist health care professionals to identify service characteristics that require improvement, as well as policymakers to understand patients' demands and, as a result, develop strategic plans for effective and higher-quality services (Batbaatar *et al.*, 2017).

SERVQUAL scale is extensively used in the literature to calculate the gap between expected and perceived service quality. SERVQUAL can help to define the dimensions that unsatisfied costumers (Altuntas and Kansu, 2020; Upadhyai *et al.*, 2020, 2022; AlOmari, 2021). However, service quality measurement is not an easy job due to the fact that there are many facts having different characteristic affecting quality. Therefore, the growing importance of service systems attracts the interest of academicians for development of new approaches to improve the quality of the services (Aksezer, 2011; Altuntas and Kansu, 2020).

The proposed of this approach to uses the service quality measurement (SERVQUAL) scale and assessing it with SEM-Pls to seek which one of the variables are not really affected to patient satisfaction. SERVQUAL (Service Quality) is often used in evaluating the quality of health services. This instrument found that many hospitals could not provide the expected quality of health-care services. Some patients who are dissatisfied with the long waiting time, insufficient medical staff and crowded waiting area of their originally visited hospital have, as migrated to new health-care service providers in the country for better treatment and services (Ahmed, Abd Manaf and Islam, 2017; Lai, Yee Yen and Siong Choy, 2020).

Hospital service quality is the totality and nature of a product or service that affects the ability to satisfy stated or implied needs. Service quality managers and hospital administrators can benefit from the use of this questionnaire to accurately measure service quality and improve upon it, leading to increased profitability (Upadhyai *et al.*, 2022). In other words, the better the hospital service quality perceived by the patient, the higher the level of patient satisfaction and vice versa (Sefnedi and Utami, 2022).

Structural Equation Modelling (SEM) is a method that allows for simultaneously testing the dependent relationship among the measured variable and laten constructs. The SEM combines two multivariate methods,

analysis factor and multiple regression analysis. Therefore, PLS aims to discover the most fulfilling predictive linear relationship within the data. It is usually used to confirm the theory and also to explain the relationship within variables (Ghozali, 2014; Hair *et al.*, 2014).

2. Methods

This study aims to examine whether there is a positive relationship in five constructs of service quality on patient satisfaction in X Surgical Hospital in Padang City. In this study, the independent variable was patient satisfaction, the dependent variables are tangible, empathy, assurance, reliability and responsiveness.

STUDY AREAS AND TARGET POPULATION

The subject in this study were all patient (inpatients and outpatients) who get treatment. Patients were enrolled based on patient registered data at the X Surgical Hospital and then contacted to ask about their willingness to take part in the research.

INSTRUMENTS AND PROCEDURES

This study was done in a quantitative manner with cross sectional design using questionnaire to collect the data. The number of samples taken was 45 respondents and reach the minimum sample for 5 rows to construct based on significancy level 5% with R square 50% (Musyaffi, Khairunnisa and Respati, 2022). The instrument used in this study was questionnaire. The instrument was made using a Likert scale on the independent variable and the Guttman scale on the dependent variable. A convenience sampling method was used where the respondents were asked for their willingness. After the respondents agree to participate the questionnaire will be given. We explain the study's goal, advantages, research protocols, and patient data confidentiality to patients. In addition, patients were given a formal informed consent form to sign. Then, using questionnaires with questions, we conducted interviews with patients. The attitude of the officers who respectful and caring was to assess the reliability; how responsive they were; the assurance of ability of the health officers; how they show empathy and tangible referred to in this study are the availability of physical facilities, equipment and means of communication in the health service process.

DATA ANALYSIS

For descriptive characteristics, a univariate analysis was conducted using SPSS 15. The test continues to assessing by SEM-PLS version 3.3.3 to test about validity, reliability, and testing model applied bivariate and multivariate analysis.

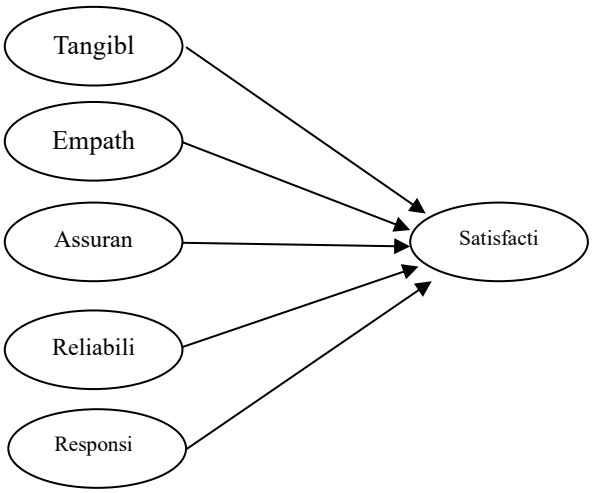

Figure 1. Conceptual Framework and Hypothesis

3. RESULT

As set out in Table 1, the results indicate that the respondents consist of 44% male (22) and 56% female (27) respondents. They were outpatients and inpatients from inside and outside Padang City, 16% and 84% respectively. Mostly respondent were young adults (17-25 years old) with 39% or 19 respondents, followed by early adult (36-45 years old) with 24% or 12 respondents. Other followed in 18% for 26-35 years old patients, 46-55 years old about 14% (7), 4% to 55-65 years old and 2% for elderly (65 years old or above). The educational background respondents generally came from high school (38% or 19 patients), meanwhile the patient with diploma degree and who just finished their elementary are same with just 2 persons respondent or 4% for each. The costumer largely receives their income in less IDR 1,5 million/month (23 participant or 46%), other varies.

TABLE 1. DISTRIBUTION OF RESPONDENT CHARACTERISTICS

Characteristic	Frequency	Percentage
Gender		
Male	22	45
Female	27	55
Live in		
In Town	8	16
Out of Town	41	84
Age		
17-25	19	39
26-35	9	18
36-45	12	24
46-55	7	14
>55	2	4
Level of Education		
Elementary	2	4
Junior High School	13	27
Senior High School	18	37
University Level	16	33
Occupation		
Housewife	18	37
Civil Servant	3	6
Employees	11	22
Entrepreneur	5	10
Students	10	20
Others	2	4
Salary (IDR)		
3,500,000	11	22
2,500,000 – 3,500,000	10	20
1,500,000 – 2,500,000	5	10
0 – 1,500,000	23	47

ASSESSMENT OF MEASUREMENT MODEL

In the second part measurement model was analysed using outer model. The outer model is examining the instrument accuracy and consistency, called as reliability test. Discriminant validity shown the value of empirical distinct each of construct. The measurement used Smart-PLS 3.3.3 software to show Cronbach's alpha and Composite Reliability values. The role of thumb used for the measurement was that the Cronbach's Alpha value should be more than 0,7 (Hair *et al.*, 2014).

TABLE 2. RESULT OF RELIABILITY TEST

Indicator	Cronbach's Alpha	Composite Reliability	Conclusion
Tangible	0,891	0,916	Reliable
Empathy	0,942	0,954	Reliable
Assurance	0,910	0,934	Reliable
Reliability	0,832	0,886	Reliable
Responsiveness	0,910	0,936	Reliable
Satisfaction	0,963	0,968	Reliable

Based on table 2. shown all the variables has both Cronbach's Alpha and composite reliability value are more than 0,7. It is that all variables are reliable. Based on "Fornel-Larker criterion" correlation to assess discriminant validity, each variable which has square root value less than average variance indicated satisfactory in discriminant validity (Chin, 2010).

The next measurement represents loading factor value to test convergent validity. Convergent validity is to measure what is mean to be measured each of indicator. Each of the constructs should have at least 0,7 with Average Variance Extracted (EVA) above 0,5 (Hair, Ringle and Sarstedt, 2011). With reference to Table 3, all indicators have loading factor scores greater than the minimum cut-off value. Moreover, each of AVE values were in the range between 0,694 and 0,893 which is greater than the minimum criteria of 0,5 with appropriate convergent validity (Henseler, Ringle and Sinkovics, 2009). AVE values state that internal inter-coloration in which indicator on every construct in laten variable (Hair *et al.*, 2014). Altogether, the measurement model exhibited satisfactory in both convergent and discriminant validity.

TABLE 3. RESULT OF CONVERGENT VALIDITY TEST

Construct	Indicator	Loading Factor
Tangible AVE = 0,893	Tan1	0,679
	Tan2	0,735
	Tan3	0,539
	Tan4	0,910
	Tan5	0,858
	Tan6	0,916
	Tan7	0,784
Empathy AVE = 0,765	Emp1	0,906
	Emp2	0,900
	Emp3	0,874
	Emp4	0,843
	Emp5	0,887
	Emp6	0,874
Assurance AVE = 0,707	Ass1	0,901
	Ass2	0,881
	Ass3	0,935
	Ass4	0,837
	Ass5	0,735
Reliability AVE = 0,694	Rel1	0,841
	Rel2	0,844
	Rel3	0,756
	Rel4	0,806
Responsiveness AVE = 0,797	Resp1	0,898
	Resp2	0,852
	Resp3	0,924

	Resp4	0,872
Satisfaction AVE = 0,712	SAT1	0,909
	SAT10	0,926
	SAT11	0,726
	SAT12	0,758
	SAT2	0,775
	SAT3	0,740
	SAT4	0,865
	SAT5	0,794
	SAT6	0,891
	SAT7	0,908
	SAT8	0,929
	SAT9	0,899

ASSESSMENT OF STRUCTURAL MODEL

The informative strength of the predicted model can be examined by considering R2 of the endogenous constructs (Chin, 2010). In this research the results of SEM-PLS analysis found that R square for patient satisfaction was 0,800. It is indicated that tangible, empathy, assurance, reliability, responsiveness has explained 80% of the variance in satisfaction as substantial (Chin, 2010).

Path coefficients were calculated to test the hypotheses and to test the relationship between variables. Table 4 shows the measurement of the strength between independent and dependent variables. Bootstrapping with 500 replications was used to obtain the path coefficients and their related t-values.

TABEL 4. HYPOTHESIS TEST

Relationship	STDEV	T Statistics	P-Values	Decision
H1: Tangible -> Satisfaction	0,124	4,845	0,000	Supported
H2: Empathy -> Satisfaction	0,109	3,034	0,003	Supported
H3: Assurance -> Satisfaction	0,092	2,281	0,023	Supported
H4: Reliability -> Satisfaction	0,077	0,789	0,430	Not Supported
H5: Responsiveness -> Satisfaction	0,116	2,706	0,007	Supported

*note: t-value greater than 1,645 **p value: <0,005

DISCUSSION

Tangibility measure by medical infrastructure, amenities and physical infrastructure and quality of room and food. The process construct depicts the responsiveness of the service provider. Patient safety and privacy, personal behaviour and charges and payments provide assurance to the customers. Caring individual attention showing empathy was indicated by the need management and discharge while diagnosis and treatment, professional skills and competence of service providers and medical communication add to the reliability of the service (Upadhyai *et al.*, 2022).

The findings of this study indicate that the establishment of higher levels of hospital service quality will lead patients to have a high level of satisfaction. In addition, to achieve competitive advantage, the hospital management needs to be aware of the relative importance of each of the service quality dimensions in the satisfaction of patients, which varies across different hospital utilization groups, and use this in strategic considerations.

RELATIONSHIP BETWEEN TANGIBLE AND PATIENT SATISFACTION

Tangible is the appearance of services provided by health care that can be seen, such as the physical structure of the health care, the integrity of medical equipment, the cleanliness of the room, and the appearance of hospital staff which is can be seen and felt directly by the patient. The results showed that tangible had a relationship with patient satisfaction (AlOmari, 2021; Endeshaw, 2021).

Tangibles are very important given by the health providers because what is seen and felt directly by the patient will change the patient's perception of the health providers. This means that if the patient feels that the physical facilities, the cleanliness of the waiting room, and the appearance of the health officers who provide services to the patient are good, the patient's perception of the health providers will also be good (Rianti *et al.*, 2022).

Since that, hospitals should be sensitive and attentive enough to the feedback provided by their patients (Lai, Yee Yen and Siong Choy, 2020). The hospital logistics department should conduct regular inspections to ensure there are sufficient light, appropriate temperature and good ventilation for the hospital hall and treatment rooms (Zhang and Liu, 2021).

The service providers should initiate strong measures to ensure that the hospital is equipped with modern physical facilities and materials that are visually appealing to both inpatients and outpatients. In addition, the hospital management must consistently ensure that their staff appear neat and presentable during their work hours. From time to time, the hospital should continue to invest in equipment, physical facilities and materials to ensure that those tangible factors are sufficient in terms of quantity (Aliman and Mohamad, 2016).

RELATIONSHIP BETWEEN EMPHATY AND PATIENT SATISFACTION

Empathy dimension require access to detailed information about target markets, their varying needs and expectations, and putting oneself in the position of the customers (empathizing) to understand how one can best help them (Aliman and Mohamad, 2016).

In hospital service, patient mostly, considered doctors as professional and well trained but the fact is that doctors do not pay attention on other key aspects such as good listening skills, and what their patients reveal (AlOmari, 2021). However, Sharma et al., 2011 indicated that 55% of patients agreed that doctors have shown little interest in listening to their problems (Sharma, Sharma and Sharma, 2011).

The attitude and behaviour of hospital staff have a strong impact on patients' experience in person. The human resources management department could implement related humanistic education programs, as well as medical professional skill pieces of training for physicians, nurses and medical technicians to set up a good interpersonal atmosphere for patients (Zhang and Liu, 2021).

RELATIONSHIP BETWEEN ASSURANCE AND PATIENT SATISFACTION

Assurance refers to employees' knowledge and courtesy, and their ability to inspire trust and confidence. Managers could use this strategy to attract and sustain customers for a lifelong relationship. The management can train the employees to help their customers by improving skills through continuous training and facilitation of organizational learning. Improving the communication skills of front-line employees, nurses, and complaints handling officers is important since these employees interact with the customers. When employees are well equipped with skills to serve customers satisfactorily in an environment that promotes excellence, reliable services will inevitably follow (Aliman and Mohamad, 2016).

RELATIONSHIP BETWEEN RELIABLITY AND PATIENT SATISFACTION

Reliability is considered as the second most important dimension in determining satisfaction. Reliability refers to accurate, dependable and consistent performance of the service (service outcome). Patients definitely expect the hospital to deliver services at the time it is promised. In addition, patients also expect the hospital staff to be capable of handling patients and to be competent enough to provide accurate services. Therefore, all staff should manage their time properly and be able to provide excellent service to customers (Aliman and Mohamad, 2016). Service behaviour in providing a service should, then, be considered to be a key strategic improvement to provide a better competitive service delivery in a professional manner (Thawesaengskulthai, Wongrukmit and Dahlgaard, 2015).

Patients form behavioural responses when they experience the services provided which further act as their reference point to determine how much time and effort they should spend. Hospitals can take advantage by introducing online checking services which include information on treatment cost and waiting time for confirming medical appointments for better financial planning where patients can estimate the required waiting time and fees for each appointment (Lai, Yee Yen and Siong Choy, 2020). Besides that, healthcare providers should pay extra emphasis on the humanistic aspect of healthcare and doctor-patient relationship management. Delivery of high service quality is a primary source of competitive advantage for healthcare providers (Zhang and Liu, 2021). Patients' perceived healthcare service quality has changed over time due to new technology, innovation and innovation in treatment. The dynamic nature of service quality suggests that hospital managers must track patients' perception over time and align product and promotional strategies associated with these changing views (Thawesaengskulthai, Wongrukmit and Dahlgaard, 2015).

RELATIONSHIP BETWEEN RESPONSIVENESS AND PATIENT SATISFACTION

Responsiveness is the willingness to help customers and provide prompt service. It might happen because all hospitals have an emergency unit and all emergency cases are given top priority for treatment (Aliman and Mohamad, 2016).

Accordingly, the more responsible staff, more responsive to the patient needs, the more they signify willingness to pay more. Its imply that hospital which desire to charge additional fees should enhance their service quality to reflect on price equity (Sefnedi and Utami, 2022). It is can be attributed to the fact that, in hospital outpatient services, patients interact much more with physicians and administrative staff than with nursing staff (Giovanis *et al.*, 2018).

Hospital service quality also influenced by behavioural compliance, in this case the higher behavioural compliance would fulfil by better implementation of hospital service quality (14).

RELATIONSHIP OF SERVICE QUALITY DIMENTION AND PATIENT SATISFACTION

The SSGRA model is revealing responsiveness of a health care facility to be the most important factor contributing to private hospitals' patient satisfaction, followed by tangibility, empathy, assurance, and reliability (Javed *et al.*, 2019). Aliman and Mohamad (2016) found that tangibility, reliability and assurance were the strong predictors of patient satisfaction. Cheng Lim and Tang (2000), in their research on Singapore hospitals through SERVQUAL, identified the service characteristics considered important for patients. Assurance and responsiveness emerged as the critical dimensions of service quality (Lim and Tang, 2000; Aliman and Mohamad, 2016). Reliability and responsiveness as important dimensions for service quality (Meesala and Paul, 2018; Javed *et al.*, 2019). The study done by Al Neyadi et al. (2018) found assurance to be the most significant dimension and responsiveness to be the least significant dimension related to healthcare service quality (Al-Neyadi, Abdallah and Malik, 2018). Adding to this, Verma, 2020 found that there is no significant association of consumer satisfaction with age, gender, education and marital status. However, Swain (2019) found that public hospitals were performing better on technical dimensions, and private hospitals performed better on functional dimensions (Swain, 2019).

Result from Al-Neyadi, 2016 find that inpatients in public hospitals were satisfied with the services provided in terms of tangibles, reliability, empathy, and assurance but were uncertain of their satisfaction regarding the responsiveness of such services. On the other hand, the inpatients in private hospitals were very satisfied with the assurance of the services provided; satisfied with the tangibles, reliability, and empathy dimensions of the services; and uncertain regarding the responsiveness of the services (Al-Neyadi, Abdallah and Malik, 2018). Tangibility, reliability and assurance are the most powerful predictors of customer satisfaction (Aliman and Mohamad, 2016).

Responsiveness, reliability and professional competence of vendor staff are identified as the most significant factors that loaded on the

latent variables in Ikediashi research in 2015 (Ikediashi, Ogulana and Odesola, 2015) Adding to this, tangible (dress professional, that the hospitals have poor physical facilities and lack adequate materials associated with their services) and reliability low; empathy high has been found in Fiakpa studies in 2022 (Fiakpa, Nguyen and Armstrong, 2022).

In practice, the ultimate goal of service systems is to meet and exceed customer requirements and to increase service quality. The proposed approach with integrated methodologies helps decision makers and managers to reach this ultimate goal. The healthcare organizations need to develop and implement quality improvement plans for their survival and success in the competitive environment of health care (Hajebrahimi *et al.*, 2019). Hospitals require continuous efforts to improve quality of the service delivery system to achieve service excellence (Altuntas and Kansu, 2020).

Hospitals should be sensitive and attentive enough to the feedback provided by their patients. The fact that there are differences in how to fulfil the each genre of costumer as found in Abu Salim, 2019 research (Abu-Salim *et al.*, 2019). Since hospital should recognize the needs and satisfaction of costumers to create loyalty, so that they did not seeking another healthcare (Bernarto and Satryautama, 2019). By investment in recruitment, training and development to raise the quality of service and maintaining a record of patient satisfaction index are some possible measures that can be taken (Lai, Yee Yen and Siong Choy, 2020). In contrast, patients perceived the time wasted trying to find information about the medical cost only led to more uncertainties or confusion over what they had initially suspected whether they would be treated adequately (Thawesaengskulthai, Wongrukmit and Dahlgaard, 2015). Hospitals, as the for-profit organizations, should take cognizance by considering post-benefit convenience to their patients. Patients should be given the opportunity to assess easily whether or not the treatment plans are the best working.

In particular, the results indicate that patients' perception of service quality delivered by medical staff mostly contributes to the overall service quality perception. The perceptions about facilities and administrative services and staff effectiveness appear to be the second and third contributors to overall service quality assessment. Nursing care is the least significant contributor to perceived service quality formulation.

Practically, the measurement scale developed in this study is easy to be understood and operated, which could provide ideas and methods for healthcare institutions to improve quality management. With the help of this scale, hospital managers could regularly evaluate the level of patients' perception of hospital service quality, have a better understanding of patients' expectations under the new condition and pinpoint appropriate initiatives to fill the service gap (Zhang and Liu, 2021).

Implication

In apply service quality the hospitals should ask themselves: What should they prepared to continue offering such inadequate services to our customers?, What should they do to strive and meet?, the exceed customer expectations and how they survive and build continuous quality improvement. However, there are no specific solutions to this challenge. Part of the solution is to conduct a study on managers/doctors/staff expectations and perceptions of hospitals' services. It is possible that perceptions of the assurance and responsiveness dimensions deemed most critical by patients are not matched by the perceptions of managers/doctors/staff. Adding to this managers need to have a commonly held definition of quality by all employees because it provides the hospital with the ultimate` `focus" for total quality healthcare. Another part of the solution is the recognition for the need of a total quality model to guide managers/doctors/staff in their continuous quality improvement journey. However, improving service quality requires planning and co-ordination. Most of all, it requires the total commitment of managers, doctors and staff.

The growth of service sector in developing and emerging markets boost the expectations of patients regarding to healthcare services, especially in healthcare settings because patients expect good service quality to become satisfied and loyal. Along with this regard, most of the service companies try to gain and

maintain competitive positions by considering the processes which lead towards quality management (Shabbir, Malik and Malik, 2016)

Limitation

There are several causal relations between enablers and service quality dimensions. Quality management enablers (leadership, policy and strategi, people, partnership and resources), Staff performance (Shabbir, Malik and Malik, 2016; Sadeh, 2017). Patient satisfaction become mediating factor between overall healthcare service quality (HSCQ) with patient loyalty. Adding to this behavioural intention should also need to be considered.

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