

Evaluating library service quality and its influence on user satisfaction: a LibQUAL study in Serbia

Uticaj dimenzija kvaliteta usluga na zadovoljstvo korisnika: LibQUAL analiza biblioteka u Srbiji

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Abstract

This study explores the relationship between the perceived quality of library services and user satisfaction in Serbian libraries, using the LibQUAL model. By analyzing adequacy and superiority gaps in three dimensions of service quality: Affect of Service, Information Control, and Library as Place, the study determines whether users' expectations are merely met or ideally fulfilled. A descriptive and regression analysis was applied to a sample of 281 users. The results indicate that all dimensions meet users' minimum expectations, while ideal expectations remain unmet, especially regarding Information Control. The regression model confirms that Affect of Service and Library as Place significantly affect user satisfaction, while Information Control has no statistically significant effect. The findings support previous research and highlight specific areas for improving library services, with implications for librarians' professional practice and future research.
Keywords: service quality, user satisfaction, LibQUAL, libraries, regression analysis

Sažetak

Ova studija istražuje odnos između percipiranog kvaliteta bibliotečkih usluga i zadovoljstva korisnika u bibliotekama u Srbiji, primenom LibQUAL modela. Korišćenjem pokazatelja jaza adekvatnosti i superiornosti, analizirane su tri dimenzije usluge: ljudski aspekt usluge, kontrola informacija i biblioteka kao prostor. Na uzorku od 281 korisnika primenjena je deskriptivna i regresiona analiza. Rezultati pokazuju da sve dimenzije ispunjavaju minimalna očekivanja korisnika, ali da idealna očekivanja ostaju neispunjena, naročito u oblasti kontrole informacija. Regresioni model potvrđuje da ljudski aspekt i biblioteka kao prostor značajno utiču na zadovoljstvo korisnika, dok kontrola informacija nema statistički značajan efekat. Nalazi potvrđuju prethodna istraživanja i ukazuju na konkretne oblasti za unapređenje usluga, sa implikacijama za bibliotekarsku praksu i smernicama za buduća istraživanja.

Ključne reči: kvalitet usluge, zadovoljstvo korisnika, LibQUAL, biblioteke, regresiona analiza

1. Introduction

In today's digital age, libraries continue to adapt their operations in response to the changing needs and expectations of users. Modern library users demand fast and convenient access to high-quality resources. Whether they need an e-book, a scholarly article, or multimedia content, they expect to obtain it as quickly as possible. The role of libraries in education, learning, and research has become increasingly important. Libraries have become an essential part of educational institutions, supporting teachers, students, and researchers alike. Through digital

services, libraries provide access to academic journals, e-books, digital archives, and other educational materials in order to fulfill their mission of offering high-quality services that meet the expectations and perceptions of their users (Oh, 2020). This requires continuous attention to emerging trends and technologies so that services remain relevant and aligned with users' needs. Digital platforms also play an important role in improving user experience and service value (Dobričanin & Aleksić, 2025). At the same time, managing non-profit organizations such as libraries requires efficient use of limited resources while maintaining service quality

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(Cvetković et al., 2024). This involves continuous attention to emerging trends and technologies so that library services remain relevant and responsive to users' needs. Fundamentally, libraries are transforming into dynamic digital institutions committed to delivering high-quality services through continuous adaptation and innovation, which are essential for maintaining their role as key contributors to education, learning, and research in the digital era.

2. Theoretical framework

In discussions of service quality, proponents of the so-called American school (Parasuraman et al., 1985) argue that perceived service quality is shaped by the comparison between users' expectations and their evaluation of the service they receive. In contrast, representatives of the so-called Scandinavian school (Grönroos, 1984) view satisfaction as equivalent to service quality, whereas Parasuraman and colleagues (1985) argue that these two constructs should not be treated as synonymous, since satisfaction is influenced by factors beyond just service quality. In the library context, delivering high-quality services requires meeting users' needs rather than relying solely on professional standards and procedures related to the acquisition and preservation of library materials (K. K. Twum et al., 2021). LibQUAL model was created by the Association of Research Libraries and Texas A&M University in order to create a standardised model for assessing library service quality (K. K. Twum et al., 2021). This model was based on the foundational SERVQUAL framework, a 22-item scale developed to assess customer perceptions of service quality which has become one of the most widely used instruments in retail and other service organizations and industries (Dašić et al., 2022; Endeshaw, 2020; Parasuraman et al., 1988; Prentkovskis et al., 2018; Stević et al., 2021). The LibQUAL instrument is a tool that is generally used for assessing library service quality, built around a three-factor model: Affect of Service, Information Control, and Library as Place. These dimensions have been widely adopted for evaluating user perceptions in academic and research libraries worldwide, though their psychometric validity and applicability in different contexts continue to be debated. (Cook & Maciel, 2010; Emmanuel & Liu, 2021; Fagan, 2014; Kiriri, 2019; Lane et al., 2011; Panahi et al., 2023). In the LibQUAL methodology, service quality is evaluated by comparing users' perceptions of the service with their expectations. User satisfaction is interpreted through two main indicators, the Adequacy Gap (AG) and the Superiority Gap (SG), both of which are linked to the concept of the zone of tolerance (Atikah & Anshori, 2023; Kangko et al., 2022; Killick et al., 2014). The Adequacy Gap (AG) refers to the difference between perceived service performance and the minimum level of service users consider acceptable. A positive (AG) value indicates that the service meets or exceeds this minimum level of expectation, typically reflecting a state of moderate or sufficient satisfaction (Atikah & Anshori, 2023; Noor & Yaacob, 2014). In contrast, a negative (AG) implies that the service does not meet even basic expectations of users, pointing to dissatisfaction and unmet needs. The Superiority Gap (SG) measures the

difference between perceived service and the ideal or desired level of service. A positive |(SG) value represents that the service exceed users' ideal expectations, reflecting a high level of user satisfaction (Atikah & Anshori, 2023; Kangko et al., 2022). However, negative (SG) values indicate that the service does not fully meet users' ideal expectations. Even if it still remains within the acceptable range, such findings suggest that further improvements are needed to provide the best possible service experience (Barfi et al., 2023; Sari et al., 2024).

According to researchers in the field of library services (Barfi et al., 2023; Mahajan & Kumar, 2019), the LibQUAL model comprises three key dimensions: Affect of Service, Library as Place, and Information Control. Affect of Service represents the human side of service and includes three original SERVQUAL dimensions: assurance, which refers to the knowledge and courtesy of employees, their ability to inspire trust, as well as material and physical security; empathy, which relates to the care and individual attention provided by library staff; and responsiveness, which reflects the willingness to assist users and provide prompt service. Library as Place is derived from the original SERVQUAL dimension named Tangibles and includes the appearance of facilities, equipment, personnel, and communication materials (Twum et al., 2021). Information Control reflects the adequacy of collections, the ease of finding and using resources, online access, and the extent to which the library enables users to locate information independently (Mahajan & Kumar, 2019).

Service quality has been recognized by scholars worldwide (Alam, 2021; Oh, 2020; Tan et al., 2017; K. K. Twum et al., 2022) as a key factor influencing the development of library user satisfaction and loyalty. Most research in this area examines the relationship between these three constructs, although some studies include additional variables depending on the context of the research.

Among the many definitions of user satisfaction, there is a widely accepted view that a business must satisfy its users in order to be considered successful and profitable. This perspective highlights the importance of customer satisfaction for organizational performance (Choshaly & Mirabolghasemi, 2019). User satisfaction is defined as "the user's response to a sense of fulfillment, representing an evaluation that a product or service has provided or is providing a pleasurable level of fulfillment related to consumption, including levels of under-fulfillment or over-fulfillment" (K. Twum et al., 2020). In the context of libraries, user satisfaction serves as a measure for evaluating the effectiveness of library services and is described as "a personal, emotional reaction to a library service or product" (Choshaly & Mirabolghasemi, 2019). Repeated use of library services is often associated with users' satisfaction with the services they receive. Satisfaction is generally linked to users' perceptions of library service quality. For this reason, higher service quality is expected to lead to greater satisfaction and, over time, to stronger user loyalty to the library (Twum et al., 2022).

In recent years, the influence of perceived service quality on user satisfaction and loyalty in libraries has attracted increasing attention from researchers around the world. Many studies have examined the relationship between service quality, user satisfaction, and loyalty in order to better understand how these constructs influence one another (Alam, 2021; Bae & Cha, 2015; Hayati & Heryanto, 2020; Oh, 2020; Tan et al., 2017; Twum et al., 2022).

Hayati and Heryanto (2020) investigated the influence of service quality and perceived user value on user satisfaction and loyalty at the Library and Archives of Padang City in Indonesia. Their findings showed that both service quality and perceived value had a significant positive effect on user satisfaction and loyalty. Similarly, Bae and Cha (2015) proposed a model for evaluating user perception, satisfaction, and loyalty in library services based on the European Customer Satisfaction Index (ECSI) framework and a review of earlier studies on overall library quality and user satisfaction. The study (K. K. Twum et al., 2021) conducted among users of a Ghana's public university library, examined "the impact of library service quality dimensions on user satisfaction, as well as the influence of satisfaction on user loyalty". Using Structural Equation Modeling, Twum et al. (2022) found that all dimensions of service quality, except library as place, had a significant positive effect on user satisfaction. Their study also confirmed a significant positive relationship between user satisfaction and user loyalty. Similarly, Alam (2020) showed that service quality had a significant positive impact on user satisfaction in a study conducted in Bangladesh using a modified SERVQUAL questionnaire. Among the service quality dimensions examined, tangibility, responsiveness, and resource availability were identified as significant predictors of user loyalty.

Tan et al. (2017) examined the effects of service experience, perceived quality, and user satisfaction on user loyalty in public libraries using the Hotel Customer Satisfaction Index (HCSI). Their results showed that both service experience and perceived quality had a significant positive effect on user satisfaction, which in turn positively influenced user loyalty. On the other hand, Oh (2023) developed a simplified instrument known as the "Library Customer Satisfaction Index Lite" (LCSI Lite) for public libraries. The proposed model demonstrated a good fit, confirming that three dimensions of service quality: "Library staff", "Library resources and user services", and "Facilities and equipment" influence user loyalty through the mediating effect of satisfaction. The studies reviewed in this literature analysis consistently demonstrate that service quality has a significant positive impact on user satisfaction and loyalty in the context of library services. However, findings from some studies (Hayati & Heryanto, 2020; Oh, 2023) suggest that other factors, such as user value, motivation, and perceived value, also play a substantial role in shaping user satisfaction and loyalty.

3. Methodology

This study used a quantitative survey design to assess library service quality from the users' perspective and examine its predictive relationship with user satisfaction. The LibQUAL+ model served as the theoretical and methodological foundation, based on three service quality dimensions: Affect of Service (AS), Information Control (IC), and Library as Place (LP).

To measure perceived service quality, the LibQUAL instrument includes three types of user ratings for each item:

- Minimum expectation (HM/M),
- Desired expectation (HI/D), and
- Perceived performance (P).

These ratings were used for the calculation of two service quality gap scores per item:

- The Adequacy Gap (AG), computed as $P - HM/M$
- The Superiority Gap (SG), calculated as $P - HI/D$,
- The Adequacy Gap (AG) shows whether the service meets users' minimum standards.
- The Superiority Gap (SG) indicates whether the service meets or exceeds users' ideal expectations.

Sample and data collection

Data were collected from a convenience sample of 281 library users through an online structured questionnaire based on the LibQUAL model. The participants included students, faculty members, and general library users from Vojvodina, Serbia. All responses were anonymous. Demographic information, including age, gender, education level, and employment status, was also gathered to describe the sample.

The study sample consists of 281 respondents, the majority within the age range of 19 to 22 years (60.9%), followed by participants aged 23 to 26 years (22.4%). Others were in age groups from 15 - 18 (3.9%), 27 - 30 (6.8%), and 31 - 34 (2.1%). Regarding gender, the majority of respondents (69%) were female, and 29.9% were male. When it comes to the educational level of respondents, half of the sample had a higher education degree (47%), while 42% had completed secondary school. Smaller part of sample had master (7.1%), doctoral (0.7%), or elementary level education (1.8%). Occupationally, the sample was diverse, but a significant majority (55.1%) identified as students. Other professions ranged widely across educational, technical, healthcare, and service sectors. The majority of participants (73.7%) reported living in urban areas, while 25.3% were living in rural settings.

Data analysis

Data analysis was conducted by using SPSS software for statistical data analysis. Descriptive statistics (means and standard deviations) were used for adequacy gap (AG) and superiority gap (SG) scores for each item from the

three service quality dimensions (namely Affect of Service, Information Control and Library as Place).

A multiple linear regression model was conducted to assess whether users' perceptions of service quality can predict overall user satisfaction. The dependent variable was user satisfaction, while the independent variables were perception scores for the three LibQUAL dimensions.

4. Results

Adequacy Gap (AG) values for Affect of Service (AS) items ranged from $M = 0.62$ to $M = 0.94$. All of them were

positive. These results can suggest that users perceive the human aspects of service (e.g. staff responsiveness, empathy, and assurance) as meeting or exceeding minimum expectations. Contrastingly, Superiority Gap (SG) values were uniformly negative ($M \approx -0.39$ to -0.53). This indicates that although service delivery was satisfactory, it hasn't reached users' desired or ideal expectations. Regarding the dimension named Affect of Service, it can be concluded that users are quite satisfied with the interpersonal service quality. On the other hand, they also expect more improvements before their ideal expectations can be fully met.

Table 1. Affect of service - Adequacy (AG) and superiority (SG) gaps

	AG		SG	
	Mean	Std. Deviation	Mean	Std. Deviation
AS1	0.9395	1.82637	-0.3915	1.41287
AS2	0.8078	1.8532	-0.3843	1.47901
AS3	0.6228	1.71965	-0.4164	1.34202
AS4	0.6619	1.74118	-0.4128	1.43192
AS5	0.6726	1.69229	-0.5267	1.52836
AS6	0.6584	1.70839	-0.4733	1.42685
AS7	0.6512	1.7544	-0.363	1.40532
AS8	0.7153	1.70422	-0.3843	1.43489

Source: Authors' research

Adequacy Gap (AG) values for Library as Place items were similarly positive ($M \approx 0.52$ to 0.68), indicating that the library's physical environment meets or exceeds users' minimum expectations. Superiority Gap (SG) values were slightly less negative than those for other dimensions (M

≈ -0.25 to -0.55), indicating relatively closer alignment with ideal expectations. Regarding the Library as a Place, it can be concluded that users are generally satisfied with the physical space, and it approaches but does not fully reach their ideal standards.

Table 2. Library as place - Adequacy (AG) and superiority (SG) gaps

	AG		SG	
	Mean	Std. Deviation	Mean	Std. Deviation
LP1	0.6584	1.85665	-0.4698	1.63444
LP2	0.5231	2.00544	-0.4342	1.49885
LP3	0.6726	1.82432	-0.2527	1.45536
LP4	0.6762	1.78038	-0.3345	1.33705
LP5	0.5267	1.84783	-0.5516	1.544
LP	0.6114	1.862924	-0.40856	1.49394

Source: Authors' research

The results across all three dimensions of library service quality show positive Adequacy Gaps ($AG > 0$), which confirm that library services satisfy users' fundamental requirements. On the other hand, consistently negative Superiority Gaps ($SG < 0$) indicate that users perceive a shortfall related to their ideal service standards. This was especially noticeable in areas of information control and human interaction. The obtained results suggest that while the library performs adequately, strategic improvements are needed to bridge the gap between basic satisfaction and optimal service experience.

Multiple regression model

Descriptive analyses indicated that participants reported relatively high levels of satisfaction with library services ($M = 7.36$, $SD = 1.47$, $N = 281$) when perceived performance was taken into account. Subscale scores were

similarly elevated, with mean scores for Affect of Service ($M = 7.18$, $SD = 1.42$), Information Control ($M = 6.94$, $SD = 1.47$), and Library as Place ($M = 7.24$, $SD = 1.45$), suggesting favourable perceptions across these dimensions.

Pearson correlation coefficients showed strong, positive correlation among all used variables. Satisfaction was significantly correlated with Affect of Service ($r = .761$, $p < .001$), Information control ($r = .669$, $p < .001$), and Library as Place ($r = .715$, $p < .001$). Additionally, intercorrelations among the predictors were substantial, with Affect of Service correlating with Information Control ($r = .776$, $p < .001$) and Library as Place ($r = .738$, $p < .001$), while Information Control also showed a strong relationship with Library as Place ($r = .744$, $p < .001$). All correlations were statistically significant at the 1-tailed alpha level of .001.

A standard multiple regression analysis was used to examine the extent to which Affect of Service, Information Control, and Library as Place predict overall user satisfaction. The tested model was statistically significant, $F(3, 277) = 158.64$, $p < .001$, explaining approximately 63.2% of the variance in satisfaction score ($R^2 = .632$, Adjusted $R^2 = .628$). Inspection of standardized coefficients indicated that Affect of Service emerged as the strongest predictor ($\beta = .482$, $t = 7.71$, $p < .001$), followed by Library as Place ($\beta = .313$, $t = 5.31$, $p < .001$). On the basis of the given results, Information

Control did not have a significant relationship with satisfaction ($\beta = .062$, $t = 0.99$, $p = .325$). Collinearity statistics were within acceptable thresholds, with all tolerance values above .33 and VIF values below 3.0, indicating no severe multicollinearity. Condition indices and variance proportions further confirmed model stability. Residual analyses showed no major violations of normality or homoscedasticity, with standardised residuals ranging from -5.31 to 4.33 and a mean of zero ($SD = .89$).

Table 4. Relationship between library service quality and user satisfaction

No.	Dimension	Beta	Part	t- value	Sig.
1.	Affect of Service	.482	.281	7.714	.000***
2.	Information Control	.062	.036	0.986	.325
3.	Library as Place	.313	.193	5.307	.000***
R = .795		R ² = .632	F-ratio = 158.640	Sig. F = 0.000***	

Note: * $p < .05$; ** $p < .01$; *** $p < .001$ Dependent variable: user satisfaction

Source: Authors' research

5. Discussion and conclusions

This study offers a deeper look into how users perceive service quality in Serbian libraries, and provides empirical validation of the LibQUAL model in the Serbian context. It was based on LibQUAL framework to evaluate gaps between users' expectations and their actual experiences. Adequacy and superiority gaps analysis across the three service quality dimensions implied how effectively library services align with what users actually need and want. The results of this study show that users generally feel that their minimal expectations are being met in their libraries. Evidence for this is the presence of positive adequacy gap values for all three dimensions of library service quality. The most favourable adequacy gap score was captured in the "Affect of Service" dimension, which is mainly the human aspect of service. This result indicates that there is a positive perception of staff professionalism, empathy, and responsiveness in the libraries. Obtained outcomes confirmed results of the prior studies (e.g., Alam, 2021; Twum et al., 2022), which pointed out the interpersonal elements of library service, as the most important element in creation of positive user experience.

Negative superiority gaps indicated that libraries are only meeting baseline expectations of the users, while not being able to reach their ideal standards. The most noticeable superiority gap deficit was observed related to the Information Control dimension. This result indicates a large difference between users' digital expectations in their libraries and what is currently offered to them. Consequently, it can be concluded that library users want more comprehensive and timely access to resources such as databases, electronic journals, and intuitive search tools. On the other hand, the dimension named Library as Place was closer to users' ideal expectations. This can be viewed through lense of permanent merit of physical space in learning environments such as libraries. This supports the view (Tan et al., 2017; Twum et al., 2022) that even in a digital age, users still benefit from quiet, resource-rich study environments.

The regression analysis provided useful insights for future research. Among the service-quality dimensions, Affect of Service and Library as Place were significant predictors of user satisfaction, whereas Information Control showed no statistically meaningful effect. This suggests that although access to digital resources is essential, it may not influence satisfaction as strongly as human interaction or the quality of the learning environment. These findings partially align with those of Twum et al. (2022), who also found a significant impact of Affect of Service, but they contrast with Hayati & Heryanto (2020), where access and perceived value had a stronger impact on satisfaction.

Taken together, the results indicate that user satisfaction depends on both access to digital tools and the quality of interpersonal service and physical spaces. Consequently, libraries cannot rely solely on their traditional strengths and they must blend core values with innovative services in order to meet the expectations of digitally savvy users. As Krsmanović (2026) notes, success is more likely when traditional approaches are paired with innovation and attention to digital users' needs and that those who successfully integrate tradition with innovation are most likely to thrive. Meeting only minimum standards is therefore not enough and libraries and their staff should aim higher by strengthening interpersonal interactions, maintaining welcoming, well-designed spaces and developing deeper relationships with their users.

Managerial implications

Several implications for library management and policy-making can be drawn from the obtained findings. Firstly, the service quality dimension related to interpersonal factors was found to be the most important factor affecting user satisfaction in libraries. This particular finding indicates that there is a justified need for continuous staff development regarding their communication skills, empathy, and their responsiveness towards library users. Those libraries which invest in the human aspects of services are more likely to obtain trust and satisfaction among users. The environment in which services are

delivered can significantly affect the user experience. In this study, this is confirmed by obtaining a relatively high predictive power of the dimension related to place. Consequently, it can be suggested that libraries should ensure learning spaces which are not only functional. Those should be created in a way to enable focused work or collaboration and user engagement, depending on user needs and aspirations. On the other hand, the negative superiority gaps for the dimension related to information control suggest that users expect more sophisticated and user-friendly systems for accessing and using information in the libraries. This can be fixed by improving existing or creating new online platforms, search engines, and digital collections.

Limitation and recommendations for future research

One limitation of this study is the sample, since it was based on convenience sampling. In addition, the study included only library users from Vojvodina, which makes it difficult to generalize the findings more broadly. Future research should include libraries from other regions and different types of institutions in order to obtain a more complete picture. Another limitation is that the study used a cross-sectional design, so it reflects user satisfaction at only one point in time. Future studies could use a longitudinal approach to examine how satisfaction changes over time and how service quality affects it. This could help show not only whether libraries meet users' expectations, but also how changes in service quality influence satisfaction. The study also relied on self-reported data, which can be affected by response bias, especially when respondents give socially desirable answers or misunderstand some of the questions. Future research could also combine quantitative and qualitative methods. Interviews, focus groups, and open-ended questions could offer a clearer insight into how users understand and evaluate library services. Expanding future research in this way could contribute to a better understanding of library services and their effect on user satisfaction.

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