

Google Maps as a Library Evaluation Tool: A LibQUAL+™ Content Analysis of University Libraries in Padang

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ABSTRACT

Background: Google Maps reviews have emerged as an accessible, user-generated source of feedback on public and institutional services, including university libraries. However, the potential of these reviews as valid evaluative data for library service quality, particularly when interpreted through an established framework such as LibQUAL+™, has not been widely explored.

Purpose: This study aims to describe the frequency of Google Maps reviews of university libraries in Padang based on the LibQUAL+™ dimensions, identify the most dominant dimension, describe sentiment trends per dimension, and analyze the characteristics and patterns of complaints at each library.

Methods: The study employs a quantitative content analysis approach, using the LibQUAL+™ framework as both a categorization tool and interpretive lens. Data were collected via web scraping from seven university libraries in Padang City listed on Google Maps. Of 434 reviews extracted, 117 valid reviews were analyzed, yielding 214 data points.

Findings: The "Information Control" dimension dominated with 78 data points (36.4%), followed by "Library as Place" with 69 data points (32.2%) and "Affect of Service" with 67 data points (31.3%). In terms of sentiment, "Library as Place" received the highest proportion of positive sentiment (85.5%); "Information Control" was generally in good condition (78.2% positive) but required attention regarding maintenance of technological infrastructure; while "Affect of Service" was the most critical dimension, showing the highest proportion of negative sentiment (34.3%) and the lowest average star rating (3.51). These findings are largely driven by data from the Andalas University Library and the UNP Central Library, which together account for approximately 80% of the total data, meaning conclusions on "Affect of Service" more specifically reflect conditions at these two libraries.

Originality/Value: This study demonstrates that Google Maps reviews, typically viewed as informal user feedback, can be systematically processed into valid library service evaluation

data through a quantitative content analysis approach grounded in LibQUAL+™. It offers a novel, low-cost method for library service assessment using publicly available user-generated content, expanding the applicability of LibQUAL+™ beyond traditional survey instruments.

Keywords: LibQUAL+™; Google Maps reviews; Library service quality; Content analysis; University libraries

1. INTRODUCTION

The digital revolution has created new ways to communicate globally (Musa, 2023; Olga & Ekaterina, 2022; Warschauer & Matuchniak, 2010). Individuals no longer merely consume information but also actively participate in content creation, driven by the widespread use of the internet and smart devices that enable direct connections and unlimited sharing of experiences (Huynh, Tan, & Lam, 2026; Jenkins et al., 2006; Mardalena et al., 2025). In this context, institutions such as libraries must adapt; their digital reputation is now just as important as their physical presence and has become a key factor in how users perceive the institution's relevance. This transformation is particularly significant in higher education, where libraries are expected not only to provide access to information but also to demonstrate their responsiveness, service quality, and relevance to increasingly digitally oriented academic communities.

Library support significantly affects the quality of higher education in Indonesia. University libraries play a vital role in sustaining the three pillars of higher education (Tri Dharma): teaching, research, and community service. Library performance also influences institutional accreditation scores. Law No. 43 of 2007 on Libraries requires libraries to meet national standards and to provide high-quality services for academic purposes. Consequently, earning a good accreditation rating depends, in part, on libraries continually improving their services based on accurate and constructive user feedback.

For institutions, including academic libraries, maintaining a presence on platforms such as Google Maps has become more than a supplementary source of digital information. These platforms increasingly function as public digital spaces in which institutional image and reputation are shaped through user-generated reviews and ratings. From a marketing perspective, such reviews can be understood as a form of electronic word-of-mouth (eWOM), whereby users share their experiences and perceptions with a wide audience through digital platforms. Unlike institution-generated promotional content, E-WOM is often perceived as more credible because it is grounded in users' firsthand experiences and is less directly associated with institutional promotional intentions (Wulandari et al., 2023). Consequently, user-generated reviews on platforms such as Google Maps may play an important role in shaping public perceptions of an academic library and its perceived quality, relevance, and credibility (Budiman, Lestanti, & Erwan, 2024). The relevance of this phenomenon becomes particularly evident in urban areas with a dense concentration of higher education institutions, where academic libraries serve large and diverse student populations within an increasingly competitive educational environment.

Padang is a major educational hub on the island of Sumatra, Indonesia, and is home to many higher education institutions that compete to attract prospective students. In this competitive environment, libraries, as units supporting academic activities, can serve as a key differentiator. Data from Goodstats—the Central Statistics Agency (BPS) 2025 shows that West

Sumatra has the highest percentage of residents who frequently visit libraries (19.3%), far exceeding the national average of approximately 11.91% (Al-Fajri, 2025). Given the large student population and ever-expanding digital resources, the strengths and weaknesses of university libraries in Padang are quickly identified and shared through Google Maps reviews.

Data from the 2024 Higher Education Database (PDDikti) statistical yearbook shows that the city of Padang has 54 active higher education institutions of various types (Data and Information Technology Center, Ministry of Higher Education and Science, 2024). However, the researcher's observations on Google Maps revealed that only seven university libraries have independent Points of Interest that can be viewed: the Andalas University Library, the UNP Central Library, the UIN Imam Bonjol Central Library, the Padang State Polytechnic Library, the ATI Padang Polytechnic Library, the STAI-PIQ West Sumatra Library, and the Bung Hatta University Library.

Addressing the validity of Google Maps reviews as academic research data requires acknowledging that open review platforms lack formal verification mechanisms to confirm whether reviewers are registered students, faculty members, or library visitors. However, because university libraries in Padang primarily serve campus communities, location-bound reviews are a plausible proxy for real user experiences. Furthermore, although voluntary online platforms often exhibit extreme response bias, whereby users predominantly leave reviews when they are exceptionally satisfied or dissatisfied (Han & Anderson, 2020), this research employs quantitative content analysis. This approach focuses on capturing systematic, recurring thematic patterns and service sentiments across institutions rather than claiming strict demographic or statistical representativeness of all library visitors.

While previous research has utilised LibQUAL+™ primarily as a formal survey tool generating gap scores (Barfi et al, 2023; Saufa, 2023) and recent studies have applied machine learning to classify Google Maps reviews into broad sentiment categories (Budiman, Lestanti, & Erwan, 2024), few studies have integrated LibQUAL+™ as an analytical lens for manual quantitative content analysis of unstructured digital feedback. This study bridges this gap by operationalising the three LibQUAL+™ dimensions: Affect of Service, Information Control, and Library as Place, as a coding scheme for Google Maps review content. Each explicit sentence is categorised and analysed alongside its sentiment score, enabling a structured evaluation of unstructured user-generated text.

This study makes both practical and methodological contributions. Practically, it provides library administrators with empirical evidence on user complaints and commendations, thereby supporting evidence-based service improvement without the costs associated with formal surveys. Methodologically, it demonstrates how unstructured online feedback can be systematically transformed into data suitable for library assessment. Specifically, the study aims to determine the frequency and distribution of Google Maps reviews across the LibQUAL+™ dimensions, to identify sentiment trends within each dimension, and to analyze institution-specific complaint patterns among university libraries in Padang.

2. METHODS

This study employed a quantitative approach, using descriptive quantitative content analysis integrated with the SEMMA (Sample, Explore, Modify, Model, Assess) data mining framework. This hybrid workflow systematically extracted, cleaned, coded, and evaluated unstructured

textual reviews from Google Maps, transforming them into structured, quantifiable data suitable for statistical interpretation.

The study was conducted in April 2026 on college libraries in Padang, West Sumatra. Out of the 54 active universities registered with [PDDikti database \(2024\)](#), a purposive screening on Google Maps identified only seven university libraries maintaining distinct Points of Interest (POI) with enabled public reviews.

Table 1. Overview of the Seven University Libraries Studied

No	Library	Institution Type	Reviews Extracted
1	Andalah University Library	Public University	220
2	UNP Central Library	Public University	138
3	UIN Imam Bonjol Padang Library	Public University	29
4	Bung Hatta University Library	Private University	28
5	STAI-PIQ West Sumatera Library	Public Religious University	14
6	Padang State Polytechnic Library	Public University	4
7	ATI Padang Polytechnic Library	Public University	1

At the library level, sampling was purposive, based on the availability of points of interest (POIs) on Google Maps. At the review level, total sampling was applied: all public textual reviews, regardless of posting date, were extracted if they met three inclusion criteria: (1) explicit reference to the library unit, (2) inclusion of a textual comment (star-only reviews were excluded), and (3) readable language (Indonesian, English, or a local dialect). Data were then extracted between April 20 and 25, 2026, using a Python-based web scraping script built with the Playwright library. The script collected all historical textual reviews and their corresponding star ratings available on each library's Google Maps page up to April 2026, without restriction on the original posting year. Data cleaning, conducted on April 26, 2026, removed ratings without text, spam, off-topic remarks, brief non-informative phrases, and emoji-only entries. This process reduced the initial dataset of 434 raw reviews to 117 valid textual reviews.

The research instruments consisted of a coding sheet, a coding book that operationally defined each LibQUAL+™ category, and a Python-Playwright scraping tool. Coding was performed at the sentence/clause level: each explicit statement regarding a specific library aspect was coded as a single data unit so that a single review could yield multiple data units; the sentiment for each unit followed the review's overall star rating and was categorized as positive (4–5 stars), neutral (3 stars), or negative (1–2 stars), following [Chen and Chang \(2024\)](#).

The validity of the instrument was established through content validity and was confirmed through consultation with the supervising instructor. Reliability was tested using inter-coder reliability based on the Holsti formula (Holsti, 1969), $CR = 2M/(N1+N2)$, applied to a pilot subsample selected proportionally from 30 reviews (71 comparable coding units) that were coded independently by two coders. An instrument is considered reliable when the Holsti coefficient exceeds 0.70. Residual coding disagreements were resolved through consensus discussions referring to the coding manual. After reliability was confirmed, the full coding of all 117 valid reviews was completed by the principal investigator.

3. RESULTS AND DISCUSSION

Data collection via web scraping from the Google Maps accounts of seven university libraries yielded 434 raw reviews. After the data cleaning stage, 117 reviews met the inclusion criteria, and coding resulted in 214 coding units, averaging 1.83 coding units per review. Notably, 177 of these 214 units (79.9%, approximately 80%) came from only two libraries: the Andalas University Library and the UNP Central Library, while the remaining five libraries together contributed only 20.1%. This concentration provides an important context for interpreting the findings in the following section.

The overall sentiment distribution of the 117 valid reviews shows that 87 reviews (74.4%) were positive (4–5 stars), 8 reviews (6.8%) were neutral (3 stars), and 22 reviews (18.8%) were negative (1–2 stars), indicating a generally favorable assessment of the Padang City University Library. Inter-coder reliability testing on 71 comparable recording units from a pilot subsample of 30 reviews yielded a Holsti coefficient $CR = 2(69)/(71+71) = 0.9718$ (97.18%), well above the threshold of 0.70, confirming that the coding categories were defined clearly enough to allow for consistent application across coders. Of the 71 units, only 2 showed coding disagreements, both of which were resolved through consensus discussions.

Table 2. Frequency of Recording Units by LibQUAL+™ Dimension

NO	LibQUAL+™ Dimensions	N	%
1	Information Control	78	36.4%
2	Library as Place	69	32.2%
3	Affect of Service	67	31.3%
Total		214	100%

The Information Control dimension is the most dominant, reflecting users' primary concern with the availability and accessibility of the collection and supporting technological infrastructure (Wi-Fi, computers, printers). This dominance aligns with the core function of the university library as a hub for academic information access.

Table 3. Sentiment Distribution by LibQUAL+™ Dimension

Dimension	Positive	Negative	Neutral	Total
Library as Place	59 (85.5%)	4 (5.8%)	6 (8.7%)	69
Information Control	61 (78.2%)	11 (14.1%)	6 (7.7%)	78
Affect of Service	41 (61.2%)	23 (34.3%)	3 (4.5%)	67
Total	161 (75.2%)	38 (17.8%)	15 (7.0%)	214

Dimension frequency and sentiment did not align. "Information Control" was the most frequently discussed dimension (78 units), yet "Library as Place" (69 units) received the most favorable evaluations, with 85.5% positive sentiment and the highest mean rating (4.45). By contrast, "Affect of Service" was the least discussed dimension (67 units) but the most critical, with 34.3% negative sentiment and the lowest mean rating (3.51, against an overall mean of 4.06).

Within Information Control, 78.2% of comments were positive, mainly praising the collection and facilities such as free Wi-Fi. The 14.1% negative comments concerned inconsistent maintenance, notably non-functioning power outlets and a neglected collection. Library as Place comments were similarly favorable, praising spaciousness, cool

temperature, and a learning-conductive atmosphere. The few negative comments (5.8%) cited poor air circulation and uneven air conditioning across floors.

Affect of Service complaints were concentrated in two institutions, which accounted for 88.1% of the dimension's units (59 of 67): UNP Central Library (32 units) and Andalas University Library (27 units). UNP Central Library had a markedly higher proportion of negative ratings (46.9%, 15 of 32) than Andalas University Library (25.9%, 7 of 27). UNP complaints centered on unfriendly security staff and inconsistent adherence to operating hours, whereas Andalas complaints concerned staff noise disrupting the reading atmosphere and restricted hours during break periods.

Table 4. Contribution of Records per Library by LibQUAL+™ Dimension

Library	Library as Place	Information Control	Affect of Service	Total
Andalas University Library	37	27	27	91
UNP Central Library	18	36	32	86
UIN Imam Bonjol Central Library	6	7	5	18
Bung Hatta University Library	5	3	1	9
STAI-PIQ West Sumatra Library	1	4	0	5
ATI Padang Polytechnic Library	1	1	2	4
Padang State Polytechnic Library	1	0	0	1
Total	69	78	67	214

This table reveals different patterns of user focus: Users of the UNP Central Library commented more on the collection, technological facilities, and staff attitudes, while users of the Andalas University Library focused more on the condition of the physical building, confirming that the dominance of data from these two large public university libraries substantially shaped the overall findings regarding dimensions and sentiments reported above.

These findings suggest that Google Maps reviews can be systematically transformed into meaningful library service evaluation data through a LibQUAL+™-based quantitative content analysis approach, expanding the framework's conventional application as a formal Likert-scale survey instrument into a tool for naturalistic coding and interpretation of unstructured user-generated content (Cook et al., 2001; Chen & Chang, 2024). This positions LibQUAL+™ not only as a gap-score measurement instrument but also as a flexible interpretive lens applicable to voluntary digital review data, a different application from previous formal LibQUAL+™ survey studies such as those by Barfi et al. (2023) and Saufa (2023).

The dominance of the Information Control dimension (36.4%) confirms that access to collections and supporting technological infrastructure remains a primary concern for university library users, consistent with the library's core function as a hub for academic information access. However, the relatively high positive sentiment in this dimension (78.2%) alongside persistent complaints about broken electrical outlets and neglected collections suggests that the underlying issue is not a scarcity of resources but inconsistency in maintaining what already exists. This finding complements previous machine learning sentiment studies, such as that by Budiman, Lestanti, & Erwan (2024), which classified reviews only into broad positive/negative categories without identifying

which specific service aspects drove those sentiments; in contrast, the dimension level coding in this study highlights maintenance not provision as the actionable issue.

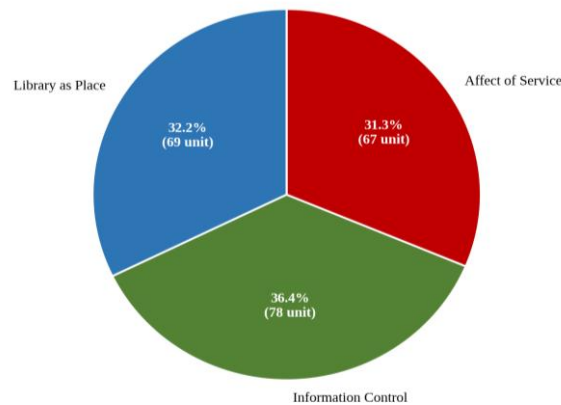


Figure 1. Proportion of Recording Units by LibQUAL+™ Dimension

The “Library as a Place” dimension, which recorded the highest proportion of positive sentiment (85.5%) and the highest average rating (4.45), indicates that investments in the physical infrastructure of comfortable reading spaces, cleanliness, and a conducive learning environment have been successfully appreciated by users. This is a very encouraging finding for library management, as investments in physical infrastructure are often the most visible and budget-intensive interventions. The results confirm that these investments have translated into tangible user satisfaction, although minor complaints about air circulation and uneven cooling distribution point to areas where gradual improvements can still be made.

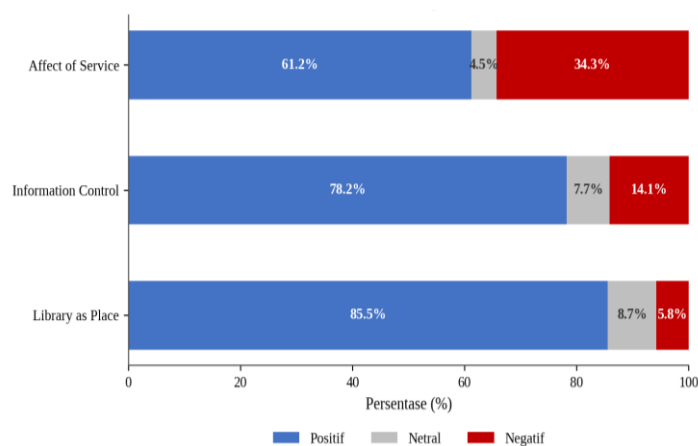


Figure 2. Sentiment Distribution by LibQUAL+™ Dimension

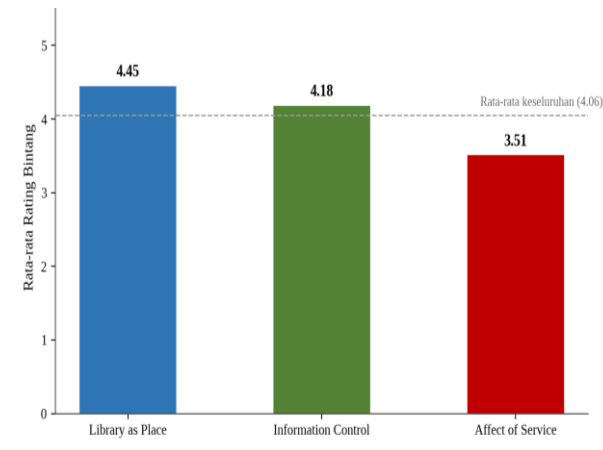


Figure 3. Average Star Rating by LibQUAL+™ Dimension

The most significant finding concerns the “Affect of Service” dimension, which, despite having the lowest frequency of observations (31.3%), exhibited the highest proportion of negative sentiment (34.3%) and the lowest average rating (3.51). This pattern of low frequency but high negativity suggests that while staff interaction issues are discussed less frequently than issues related to the collection or facilities, when they do arise, they generate disproportionately strong dissatisfaction, likely because service interactions are direct and emotionally charged experiences, in contrast to passive observations of the collection or space. A key finding of this research data is that 88.1% of the “Affect of Service” units originated from just two libraries, meaning these critical findings should not be generalized to all seven university libraries. Instead, “Affect of Service” more specifically reflects the operational conditions at the Andalas University Library and the UNP Central Library the two libraries with the largest volume of reviews, the highest number of visitor reviews, and consequently, the heaviest staff workload.

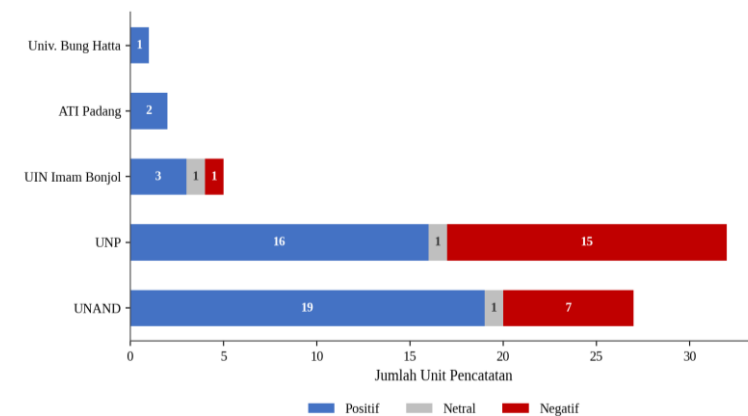


Figure 4. Distribution of Sentiment in the “Affect of Service” Dimension by Library

Interpreted through the theory of Electronic Word of Mouth ([Attaallah, 2022](#); [Huete-Alcocer, 2017](#)), these findings underscore the reputational risks inherent in unfriendly staff interactions: because such reviews are shared voluntarily and are publicly visible, negative service experiences particularly those involving security personnel, who are users’ first point

of contact can disproportionately shape prospective users' perceptions before they visit the library. This aligns with the literature on information user behavior (Kumari & Sharma, 2021), which frames online reviews as a form of information-sharing behavior following direct service experiences; the intensity of negative service reviews indicates that dissatisfied users are highly motivated to share their experiences publicly, consistent with the phenomenon of extreme response bias documented by Han and Anderson (2020).

A recurring pattern across all three dimensions is that most of the problems identified reflect inconsistencies in maintaining existing quality rather than a lack of resources: facilities and equipment are present but not maintained, published operating hours do not match conditions on the ground, and staff on duty are sometimes unfriendly. This has significant practical implications, as it suggests that service improvements do not always require large capital investments in new acquisitions, but rather a stronger managerial commitment to maintenance discipline, staff conduct standards, and operational consistency a far more achievable path to improvement for resource-constrained college libraries.

Theoretically, this study provides evidence that unstructured, voluntary online reviews constitute valid academic data when processed through an appropriate categorization framework, thereby expanding library science methodology beyond conventional survey instruments. Methodologically, the successful adaptation of the SEMMA data mining framework into quantitative content analysis for library science, combined with simultaneous double-layer coding of sentiment and service dimensions within a single coding unit, constitutes a novel methodological contribution that distinguishes this study from previous sentiment analyses (Budiman, Lestanti, & Erwan, 2024) or theme-specific qualitative analyses of online library reviews (Nurhidayah & Novianto, 2025).

In practical terms, these findings provide university libraries in Padang with an evidence base for prioritizing service improvement policies: staff training programs, particularly for security personnel, systematic scheduling of technology maintenance, and accurate, regularly updated digital information (such as operating hours) emerged as the most impactful and lowest-cost interventions. Libraries are also encouraged to treat Google Maps reviews as an active, continuously monitored feedback channel, rather than a passive digital directory.

Nevertheless, these implications must be interpreted in light of the limitations in data distribution acknowledged by this study: since approximately 80% of all data came from just two university libraries, the conclusions, particularly those regarding the Affect of service, more accurately describe the conditions at the Andalas University Library and the UNP Central Library than the overall conditions at all seven university libraries in Padang.

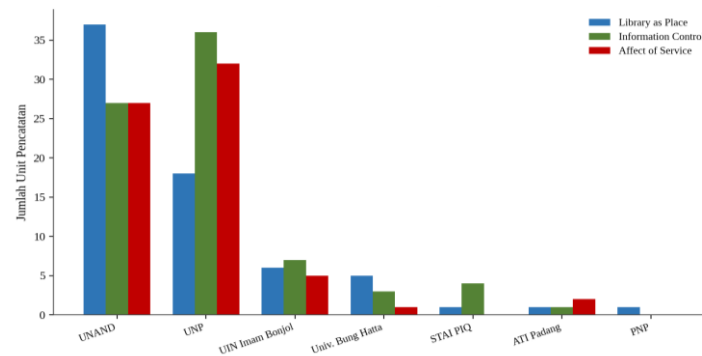


Figure 5. Contribution of Each Library's Cataloging Unit by LibQUAL+™ Dimension

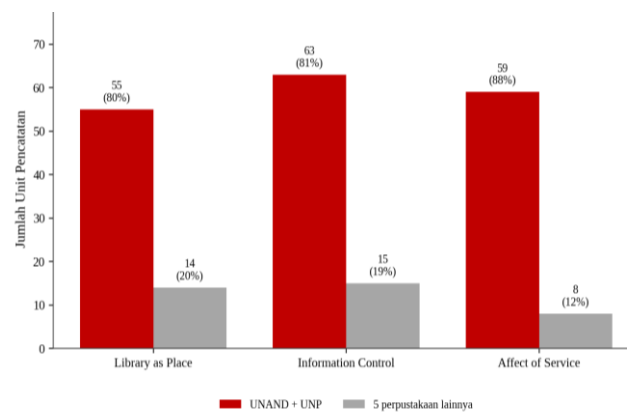


Figure 6. Data Contribution: Andalas University Library and UNP Central Library Compared to Five Other Libraries by LibQUAL+™ Dimension

Data from the Andalas University Library and the UNP Central Library consistently dominate all three dimensions, with their combined contribution ranging from 80% to 88%. Given that these two libraries are located at public universities with a far larger number of students and a higher visitation rate than the other five libraries studied, most of which come from private higher education institutions or agencies with relatively fewer students. The distribution of reviews across libraries is highly uneven: the Andalas University Library (46 reviews) and the UNP Central Library (48 reviews) dominate with 80.3% of all data, while the Padang State Polytechnic Library and the ATI Padang Polytechnic Library each have only 1 valid review. This condition means that the findings for libraries with few reviews are very limited, the findings on the Affect of Service dimension in particular more specifically reflect conditions at the Andalas University Library and the UNP Central Library than an even representation of all seven libraries.

4. CONCLUSION

This study analyzed the content of Google Maps reviews regarding college libraries in Padang using a LibQUAL+™-based quantitative content analysis approach. Of the 434 reviews extracted, 117 valid reviews yielded 214 coding units. Four main conclusions emerged. First, "Information Control" dominated the coding units (36.4%), followed by "Library as Place" (32.2%) and "Affect of Service" (31.3%), with an average of 1.83 coding units

per review, indicating specific comments rather than merely general remarks. Second, users most frequently discussed collection access and infrastructure, reflecting the centrality of information access to the library experience. Third, sentiment distribution varied significantly across dimensions: "Library as Place" received the most favorable evaluations (85.5% positive); "Information Control" was generally positive (78.2%) but was marked by inconsistent technology maintenance; and "Affect of Service" was the most critical dimension, with the highest proportion of negative sentiment (34.3%) and the lowest average rating (3.51). Fourth, library-level characteristics vary significantly: The Andalas University Library and the UNP Central Library together account for approximately 80% of all surveyed units, meaning that these findings, particularly regarding Affect of service, more specifically reflect conditions at these two institutions rather than a uniform picture across all seven libraries studied.

Overall, university libraries in Padang demonstrate strong physical infrastructure and collections but face more serious challenges in terms of human resource consistency and operational reliability, particularly at the two most frequently reviewed institutions. This study confirms that Google Maps reviews can be reliably processed into valid library service evaluation data through LibQUAL+™-based quantitative content analysis, offering libraries an evidence-based, low-cost alternative to formal survey instruments for identifying service improvement priorities.

AUTHORS' CONTRIBUTIONS

Danar Wibowo: Writing original draft preparation, ideas, formulation or evolution of overarching research goals and aims, research design, data collection, coding, data analysis. **Rahmi Yunita:** Supervision, methodology validation, manuscript review. **Nadiah Sifa Daulay:** Supervision, instrument validation, manuscript review. **Muntashir:** Supervision.

CONFLICT OF INTERESTS

We state that there are no known conflicts of interest linked with this publication, and that there has been no significant financial assistance for this work that could have influenced its outcome.

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