



Measuring the Economic Efficiency of Bibliographic Search Services by Applying the ROI Methodology in Library and Information Science: An Analytical and Prospective Study

قياس الكفاءة الاقتصادية لخدمات البحث الببليوغرافي من خلال تطبيق منهجية (ROI) في علم المكتبات: دراسة تحليلية استشرافية

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Abstract

This study proposes an integrated framework to ensure the sustainability of bibliographic search services in the competitive digital landscape by shifting focus from operational efficiency to economic efficiency. The methodology connects Activity-Based Costing (ABC) to accurately determine the unit cost with Cost-Benefit Analysis (CBA) to quantify the researcher's time savings into a monetary benefit. This approach yields a positive Return on Investment (ROI), essential for demonstrating service value. The competitive advantage is rooted in the librarian's human reliability and critical depth. The study advocates for using the measured ROI in Evidence-Based Marketing strategies, envisioning the librarian as a knowledge value analyst and a strategic, value-producing partner.

Keywords

Return on Investment (ROI);
Economic Efficiency;
Bibliographic Search Services;
Competitive Marketing; Activity-Based Costing (ABC).

JEL Classification Codes : M41 ; L86 ; D61 ; O32

الكلمات المفتاحية

العائد على الاستثمار
(ROI)؛ الكفاءة
الاقتصادية؛ خدمات
البحث الببليوغرافي؛
التسويق التنافسي؛ تحليل
التكلفة على أساس النشاط
(ABC).

الملخص

تتناول هذه الدراسة التحليلية الاستشرافية التحدي الوجودي الذي تواجهه خدمات البحث الببليوغرافي في البيئة التنافسية الرقمية، حيث تُقدم إطاراً منهجياً متكاملاً لقياس الكفاءة الاقتصادية عوضاً عن الكفاءة التشغيلية فقط، ويعتمد الإطار المقترح على ربط أدوات المحاسبة الإدارية (مثل ABC) لتحديد التكلفة الحقيقية للوحدة، مع منهجية تحليل المنفعة والتكلفة (CBA) لتحويل توفير وقت الباحث وجهده إلى قيمة نقدية تُحقق عائداً على الاستثمار (ROI) إيجابياً، وتُبرز الدراسة أن الميزة التنافسية تكمن في الموثوقية البشرية والعمق النقدي للمكتبي، مُشددة على ضرورة تبني استراتيجيات التسويق القائم على الدليل (Evidence-Based Marketing) باستخدام قيمة ROI المُقاسة، وتستشرف النتائج تحول دور المكتبي إلى مُحلل قيمة معرفية، مما يضمن استدامة الخدمة ومركزيتها كشريك استراتيجي مُنتج للقيمة..

تصنيف JEL: M41 ; L86 ; D61 ; O32

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I. INTRODUCTION:

The last two decades have witnessed a fundamental shift in the global information landscape. The exponential growth of digital content has ushered in the Knowledge Economy, where information flow and processing are now key drivers of economic value and competitiveness for both institutions and individuals. In this context, search and information retrieval services are no longer mere support functions; they have become strategic assets requiring precise measurement mechanisms to ensure their efficiency and effectiveness.

Bibliographic Search Services are a traditional cornerstone of library and information science, representing a systematic process of exploring, analyzing, and synthesizing relevant information sources to meet user research or professional needs. However, these services face an existential challenge with the rise of automated open platforms and AI-driven search engines. This places libraries and information centers in a highly competitive marketing environment that demands a serious re-evaluation of their operating methodologies.

Institutional funding structures often view libraries as a "cost center" rather than an "investment center," leading to constant pressure to justify budgets. To overcome this perception, it has become imperative to shift from simply measuring Operational Efficiency (internal processes) to measuring Economic Efficiency, which focuses on analyzing Return on Investment (ROI)—that is, quantifying the added value or economic savings the service delivers to the end-user.

This transition requires integrating macro- and micro-economic conceptual frameworks into information services management. Key tools include Cost-Benefit Analysis (CBA) and Activity-Based Costing (ABC). These methodologies allow for the detailed breakdown and accurate allocation of the service's total costs to actual work steps, paving the way for calculating the true cost per unit of the bibliographic service, which is the cornerstone for assessing efficiency.

In a competitive environment, it's not enough for a service to be internally efficient; it must also be marketable. This is where Competitive Marketing plays a vital role, necessitating the identification of the Competitive Advantage of expert-provided bibliographic services, often rooted in accuracy, comprehensiveness, and neutrality. To achieve this, measurement tools must be built on a foundation that allows for a comparison between the value offered by the library and the value provided by commercial or free competing alternatives.

The measurement process requires a robust analytical framework that defines the necessary tools and Key Performance Indicators (KPIs) for assessing inputs and outputs. These tools are not limited to quantitative metrics (like request volume or cost) but extend to include the qualitative measurement of Perceived Value through user satisfaction and time-saving metrics. This analysis is leveraged to develop an improved business model that ensures the service's sustainability and market attractiveness.

Based on the above, this study is of paramount importance in redefining the strategic role of the librarian and information professional in the digital age. The ability to measure and analyze the economic efficiency of bibliographic search services and employ these results in competitive marketing strategies will enable libraries to convert economic challenges into opportunities, solidifying their status as effective partners in knowledge production and institutional decision-making.

1. Statement of the Problem:

The research problem stems from the clear contradiction between the perceived academic and research value of bibliographic search services—and their critical role in supporting scholarly work—and the absence of unified economic and methodological measurements that translate this value into quantifiable metrics for administrative use. At a time of increasing pressure to reduce expenditures, information institutions lack practical analytical tools to prove that the investment of time and human resources in these services yields an economic return that exceeds their cost, especially amid the proliferation of rapid, free digital alternatives.

The problem is compounded by the service's direct involvement in a non-traditional competitive marketing environment, where open sources and AI-driven technologies represent fierce competitors offering quick

solutions. This necessitates understanding how to assess the inherent competitive advantage of specialized bibliographic services (such as quality, accuracy, and critical judgment of information) and how to translate this qualitative advantage into quantitative economic efficiency indicators that justify their preference over cheaper or more easily accessible alternatives.

The core of the problem lies in the urgent need to design and define an integrated analytical and methodological framework that combines economic measurement tools (like ABC and CBA) and marketing measurement tools (like positioning and competitive advantage analysis). This framework is needed to reliably and practically estimate the economic efficiency of bibliographic services and leverage the results to formulate effective marketing strategies that ensure the service's sustainability and maximize its economic impact within and outside the parent institution.

The main question posed by the study is: What are the methodological measurement tools, and how can they be leveraged to evaluate the economic efficiency of bibliographic search services within a competitive information marketing environment?

2. Sub-Questions:

The study proceeds from the main question to determine the following detailed aspects:

- What are the most suitable cost analysis mechanisms (such as ABC and CBA) that can be applied to calculate the true cost per unit of specialized bibliographic search service?
- How can the qualitative benefit of bibliographic search service (such as accuracy and comprehensiveness) be translated into quantitative economic value, particularly concerning time and effort savings for beneficiaries?
- What are the marketing indicators (KPIs) that should be used to compare the economic efficiency level of the library's service with competitive alternatives available in the open digital market?
- How can an integrated analytical methodological framework be designed that links cost measurement, value assessment, and the determination of the bibliographic service's competitive advantage?
- What are the suggested strategies that libraries can adopt, based on economic efficiency measurement results, to enhance the marketing position of their services and ensure their sustainability?

3. Study Objectives:

The primary objective of this study is to build an integrated analytical framework that information institutions and libraries can use to evaluate their economic efficiency and reposition themselves in the competitive marketing environment. This is achieved through several sub-objectives related to translating knowledge value into material value:

- To identify and detail appropriate economic measurement tools (like Activity-Based Costing) that assist in the accurate allocation of costs and the calculation of the true cost of providing bibliographic search service.
- To develop a practical methodology for estimating Return on Investment (ROI) by converting the service's qualitative benefit (such as saving researcher time and ensuring information quality) into tangible monetary indicators that justify the investment.
- To analyze marketing and competitive factors by defining Key Performance Indicators (KPIs) that compare the library's service performance and quality with that of commercial or automated competitors.
- To provide a set of practical recommendations and strategies that utilize economic efficiency measurement results to formulate effective marketing campaigns, thereby ensuring service sustainability and enhancing the library's strategic role as an effective, value-producing partner in the parent institution.

4. Study Methodology and Tools:

This analytical study requires a dual methodology that combines theoretical depth with a forward-looking application. The analytical-deductive approach will be adopted as the fundamental research starting point. This

approach aims to extract and deconstruct theoretical frameworks and concepts related to economic efficiency measurement (such as Cost-Benefit Analysis models and ROI indicators) from three fields of knowledge: Economics, Competitive Marketing, and Information Systems Management.

The study will critically analyze previous literature and research to identify methodological gaps in applying these tools to bibliographic search services. Subsequently, a modified conceptual framework will be deduced to align with the specific nature of information services, grounded in established accounting and economic principles to ensure the formulation of accurate efficiency equations and metrics. The descriptive approach will also be used to analyze the current state of bibliographic search services in various information institutions and identify the marketing challenges they face, paving the way for building the practical framework.

To implement this analytical and prospective framework, the study will rely on a set of methodological tools focused on the theoretical and constructive aspects:

- Critical Document Review: Analyzing specialized articles and studies that address the application of ABC and CBA models in the non-profit services sector.
- Analysis of Financial and Administrative Performance Reports: Examining reports related to operating costs in libraries and information centers (as a prospective case study).
- Conceptual Modeling: Used to design the proposed analytical framework, accurately defining KPIs and how to utilize extracted data to formulate competitive marketing strategies for the services.
- Comparative Analysis: Employed to compare the prices and costs of competing services in the external market to determine the competitive advantage, with the goal of providing results and recommendations that are practically applicable to professional practice development.

II. CONCEPTUAL FRAMEWORK FOR THE STUDY:

The dramatic developments in the knowledge economy necessitate a redefinition of the role of information services within academic and research institutions. These services should no longer be treated merely as "cost centers" or administrative expenses, but as strategic assets and generators of economic value. This conceptualization aims to link expenditure on specialized information services with contemporary economic concepts, such as Marginal Productivity and Cost-Benefit Analysis (CBA). This shift is crucial for establishing the theoretical justification for the Return on Investment (ROI) methodology, which requires a quantitative measure of the added value and benefits realized. Information services must be viewed as an investment process aimed at maximizing the institution's knowledge yield and, consequently, its overall economic efficiency, requiring a rigorous financial assessment of its impact.

1. The Nature and Economic Classification of Bibliographic Search Services in the Digital Age:

1.1. From Traditional Retrieval to Curated Information:

Bibliographic search service has undergone a radical transformation, moving from simple identification and retrieval of documents to curated knowledge production. Amidst digital infobesity, the librarian's role now involves applying critical judgment and specialized expertise to filter sources, evaluate their quality and reliability, and transform raw data into processed information ready for immediate research use (Riera, Padrós, & Zuñiga, 2012). This evolution confers high added value on the service, as the librarian focuses on the efficiency of the researcher's inputs, saving time and effort that can be directed toward analysis and scholarly output—a core element of the service's economic return.

1.2. Economic Classification: A Quasi-Public Good:

The economic classification of specialized bibliographic search service is complex, as it doesn't fully align with traditional goods:

- Public Good: Characterized by non-excludability and non-rivalry (like street lighting), which partially applies to the basic availability of library collections (Guido & Rana, 2012).

- Private Good: Defined by excludability and rivalry (like purchasing a single book).
- Quasi-Public Good/Club Good: This is the most applicable classification for specialized services. They are relatively non-rivalrous (several researchers can benefit from the librarian's expertise), but they are excludable because they rely on the librarian's limited time and expertise and require resource allocation that can be withheld from non-beneficiaries. This distinction is vital for justifying the necessary resource investment.

1.3. Core Quality Characteristics of Specialized Bibliographic Service:

The quality of the bibliographic service is foundational to its economic success and is measured by specific attributes:

- Accuracy: The correctness and reliability of the sources provided, ensuring they match the research context to minimize errors and wasted time.
- Comprehensiveness: The service's coverage of all aspects of the topic without overlooking essential or advanced sources.
- Neutrality: Presenting sources impartially and objectively, free from bias toward any idea or theory, to support honest scholarship (Creswell, 2014).
- Timeliness: The characteristic most directly linked to economic value, as delivering information at the precise moment a researcher needs it translates to direct cost savings and increased research cycle efficiency.

1.4. Economic Efficiency and Cost Justification in Non-Profit Institutions

Defining Economic Efficiency: Technical vs. Allocative

Non-profit institutions, such as libraries, require a comprehensive definition of efficiency that goes beyond mere cost reduction:

- Technical Efficiency: Focuses on the input-output relationship, i.e., achieving the maximum possible output (bibliographic search services) with the minimum possible inputs (budget, librarian time) (Salomon, 2019).
- Allocative Efficiency: Concerns the optimal utilization of resources, meaning allocating resources to services that generate the highest overall benefit for the institution and its researchers. A service is deemed economically efficient when it achieves high technical efficiency while directing resources toward activities of highest value to the end-user (Changhee, Kim, & Kanghwa, 2020).
- Shifting from Needs-Based to Productivity-Based Justification: The study's methodological framework requires a shift from a needs-based justification model (which asserts the service's necessity) to a productivity-based justification model. This transition demands the quantitative measurement of Impact, linking every dollar spent on the service to a realized productive value, such as reduced search time, an increase in published research, or enhanced institutional competitiveness in grant acquisition. This transformation establishes the service as a mandatory investment for sustaining research productivity (Kimberly & al, 2023).

1.5. Key Value Indicators

To comprehensively measure economic value, three primary indicators are distinguished:

- Use Value: The direct, objective monetary value resulting from the service's use, primarily measured by quantifying the time and effort saved and converting them into a financial equivalent.
- Perceived Value: The subjective value seen by the beneficiary, typically measured through satisfaction surveys or determining the researcher's Willingness-to-Pay (WTP) for the service, reflecting its strategic importance from the user's perspective (Brander & al, 2024).
- Residual Value: The long-term, sustained economic effect of the service on the institution, such as enhancing its research reputation, improving the quality of its scholarly output, and establishing a robust knowledge base that supports subsequent research generations.

2. Return on Investment (ROI) in Library and Information Services

2.1. ROI Concept and Calculation in the Knowledge Context

The Return on Investment (ROI) is the strongest financial indicator for measuring the efficiency of any investment. In the context of knowledge services, it is the central tool for translating intangible services into an

economic language understandable to senior management and decision-makers. Here, ROI is not limited to measuring direct profitability but extends to include the added value realized for the institution's mission and research goals (Deneise & Matthew, 2022).

ROI in the library sector is defined as the percentage of net benefits realized (after deducting the investment cost) from providing a specific information service, where benefits are monetized. A positive ROI indicates that the service not only covers its costs but also generates a value surplus, which translates into savings in operating expenses for users or an increase in their productivity.

2.2. ROI Calculation Mechanism:

The basic ROI formula is the starting point, with its variables adapted for the non-profit environment (Jason, 2025):

$$ROI = 100 \times \frac{(\text{Monetized Value of Benefits (Return)} - \text{Cost of Service (Investment)})}{\text{Cost of Service (Investment)}}$$

- Investment (Cost): Advanced accounting methodologies (like Activity-Based Costing - ABC) must be used to determine the true direct and indirect cost of a single unit of bibliographic search service (e.g., librarian's salary cost, database licenses, technical equipment depreciation).

- Return (Monetized Value of Benefits): The greatest challenge lies in monetizing benefits. This is primarily achieved through Cost-Benefit Analysis (CBA), where intangible benefits, such as time and effort saved for researchers, are translated into monetary gains (Vilaplana & Guangya, 2025).

2.3. The Challenge of Measuring Intangible Benefits:

Intangible benefits (time savings, improved research quality) are the primary source of value but pose the greatest challenge for quantitative measurement. The key is Monetization:

- Estimate Time Saved: Determine the average time a researcher would have spent to achieve the same task efficiency without the librarian's help, minus the actual time spent with assistance.
- Determine Reference Cost Rate: Use the researcher's or academic's Reference Hourly Wage Rate (including fringe benefits and associated costs) as a benchmark.
- Calculate Monetary Value: Multiply the time saved by the reference hourly wage rate. The resulting figure represents the Direct Monetary Return from the service:

$$\begin{aligned} \text{Monetary Value of Time Saved} \\ = \text{Time Saved (in units)} \times \text{Researcher's Reference Hourly Work Cost} \end{aligned}$$

2.4. Simplified Mathematical Models for Estimating Return

To simplify ROI application, mathematical models focusing on the most impactful variables (human resources and technology) can be used:

- Human Capital ROI Model: Focuses on the return from investing in the librarian's expertise:

$$\text{Human Return} = \frac{\text{Monetized Value of Time Saved through Service}}{\text{Total Annual Cost of Specialized Librarian}}$$

This shows how many times the librarian "recoups" their salary cost for the institution by saving high-cost researchers time and effort.

- Technology ROI Model: Aims to justify spending on database licenses and specialized search engines (Ketevan, 2023).

$$\text{Technology Return} \propto \text{Monetary Value of Reliable Indirect Access to Information} \times \text{Cost of Licenses}$$

The return here is translated into avoiding the cost of individual article purchases and the effort saved from manual searching.

- Adjusted Net ROI Model: The most comprehensive model, integrating key costs and benefits:

$$\text{Net ROI} = \frac{(\text{Value of Time Saved} + \text{Value of Avoiding Research Errors}) - (\text{Cost of Human Resources} + \text{Cost of Technology Resources})}{\text{Total Cost of Service}}$$

This final index provides the comprehensive economic argument for the sustainability of bibliographic search service.

3. Economic Measurement Tools (Measuring Inputs and Costs)

Accurately determining the True Cost (the denominator in the ROI equation) of bibliographic search service is fundamental. Relying on advanced cost accounting methodologies avoids arbitrary allocation of administrative costs, ensuring the calculated Investment (I) accurately reflects the service's resource consumption. This integrates three main economic tools: ABC to break down activities, TCO to estimate total ownership costs (Alina, 2023), and Opportunity Cost to ensure allocative efficiency.

3.1. Activity-Based Costing (ABC)

ABC is essential for estimating the **Cost Per Unit** of service, moving beyond traditional overhead allocation. ABC extends beyond direct costs to include indirect costs associated with the actual, resource-consuming activities.

3.2. Applying ABC to Bibliographic Search:

The service is broken down into a sequence of measurable activities (Cost Objects):

- Intake & Needs Assessment: Time spent on initial interviews and precise requirement analysis.
- Actual Search & Retrieval: Librarian time dedicated to querying databases and digital repositories.
- Evaluation & Critical Filtering: Applying critical and methodological criteria to select the most reliable and relevant sources.
- Synthesis & Organization: Time spent compiling the final bibliography and formatting references.
- Delivery & Follow-up: Time for presenting and explaining the service and handling subsequent inquiries (Meredith, 2025).

Determining Cost Drivers: Cost drivers are the factors that cause resource consumption for each activity and are used to allocate indirect costs (e.g., Librarian time, number of database queries, subject complexity).

Calculating Cost Per Unit: Total allocated service cost is divided by the total number of searches completed to find the Cost Per Unit (vencru, 2024):

$$\text{Cost Per Unit} = \frac{\text{Total Allocated Cost for the Service}}{\text{Number of Completed Searches}}$$

Total Cost of Ownership (TCO)

The TCO model ensures that no costs related to the necessary infrastructure (capital or operational) are overlooked.

TCO Application to Infrastructure Costs:

TCO includes a wide range of costs distributed to the service:

- Direct Acquisition Costs: Database subscriptions, e-journal subscriptions, and reference management software.
- Operating and Support Costs: Salaries for library IT support staff, training costs for advanced search techniques (William, 2013).
- Administrative Costs: Costs related to contract management, licenses, and procurement.

Including Depreciation Costs: For financial accuracy, Depreciation must be included:

- Technical Asset Depreciation: A portion of the long-term cost of technical assets (servers, specialized computers) is allocated to the service cost annually.

- Human Capital Depreciation: Continuous training costs are viewed as a capital investment aimed at renewing skills, and their cost should be justified by the expected return that slows the depreciation of human asset efficiency (Areej, 2023).

3.3. Opportunity Cost Analysis

Opportunity Cost Analysis is a vital economic tool for evaluating Allocative Efficiency in non-profit institutions.

Definition in the Library Context: Opportunity Cost is the value of the best alternative that was forgone or sacrificed by allocating current resources to the bibliographic search service. For example, if highly efficient librarian time is allocated to this service, the opportunity cost might be the value lost by not allocating that time to a comprehensive information literacy training program for all graduate students (Hooper, 2024).

Importance in Decision-Making: Including this cost ensures that the library's scarce resources are distributed to services that generate the highest net value for the institution as a whole, guiding management toward investments with greater economic and knowledge return.

4. Tools for Measuring Benefit and Value (Measuring Outputs)

Measuring benefit and value (the numerator in the ROI equation) is the most challenging and critical aspect of library service evaluation, given their intangible nature. These tools aim to establish a robust methodological framework for justifying investment by demonstrating the **economic return** generated for beneficiaries and the institution.

4.1. Cost-Benefit Analysis (CBA)

CBA is the essential economic tool that allows for the translation of non-monetary benefits into monetary value, making it crucial for completing the ROI measurement process.

Theoretical Framework: CBA involves a systematic, standardized comparison between the estimated costs (identified via ABC and TCO) and the monetized benefits. Successful application requires identifying all possible, direct, and indirect benefits and converting them into a unified currency for comparison. CBA success proves that the value realized from the service exceeds the economic sacrifice (cost) (Thanh-Xuan, 2025).

4.2. Measuring Economic Benefit from Time Savings:

Time and effort saved for researchers is the most significant source of direct value. Measurement uses the following steps:

- Estimate Time Saved: Quantitative survey or expert estimation of the time the specialized librarian saved the researcher in accessing accurate, filtered information.
- Determine Monetary Value per Hour: The average wage of a researcher/academic at the institution is used as a standard unit of measure (including social costs).
- Calculation: Hours saved are multiplied by the monetary value per hour, providing a direct monetary return figure (Return) for the service (Jaffer, 2023):

$$\text{Researcher Hours Saved} \times \text{Researcher's Average Hourly Cost} = \text{Monetary Value of Time Saved}$$

4.3. Measuring Benefit from Quality Improvement:

This indirect benefit results from the accuracy and comprehensiveness of the bibliographic output. It can be linked to the probability of success for the researcher's project, quantified through estimation models:

- Loss Avoidance: Estimating the potential cost of re-searching or error in results (due to unreliable sources). Avoiding this loss is considered a realized monetary benefit.
- Increased Funding Opportunities: Service quality can be linked to an increased chance of the institution or researcher securing competitive Grants; a portion of the grant value is counted as an indirect benefit resulting from the bibliographic service's support.

5. Measuring Perceived Value

Perceived Value is a vital indicator for determining the service's marketability and sustainability, focusing on the user's assessment detached from pure accounting costs.

- Modified SERVQUAL Scales: Used to methodologically assess service quality from the beneficiary's perspective across five dimensions (Reliability, Responsiveness, Assurance, Empathy, Tangibles) (Parsu, Valarie, & ILeonard, 1988), which serve as quality indicators supporting economic value.
- Willingness to Pay (WTP): Used via Contingent Valuation Surveys to estimate the perceived value. Users are asked how much they would be willing to pay for the same service if provided by a commercial source. This estimate provides a monetary figure for perceived value and is a strong indicator of the importance users place on the service, serving as a supporting indicator for the value calculated in CBA.
- Customer Loyalty: An indirect measure of long-term value. A loyal user is less costly to serve and more likely to exhibit Repeat Usage. Measured via Repeat Usage Rates and Net Promoter Score (NPS) (Asier, 2022).

5.1. Key Performance Indicators (KPIs) for Value and Efficiency

KPIs measure the effectiveness and economic success of the knowledge production process.

- Efficiency KPIs: Focus on speed and accuracy (e.g., Success Rate, Turnaround Time, Cost Per Search Unit from ABC).
- Value KPIs: Focus on the actual economic return (e.g., ROI, Net Present Value - NPV for long-term investments, Payback Period) (Olha, Kateryna, & Yevhen, 2024).
- Customer Acquisition Cost (CAC): Used in internal library marketing to measure the efficiency of outreach efforts:

$$CAC = \frac{\text{Cost of Promotional Activities for Search Service}}{\text{Number of New Beneficiaries}}$$

This helps evaluate if resources for attracting users are effectively utilized, supporting Evidence-Based Marketing strategies.

5. Analytical Tools in a Competitive Marketing Environment

In the digital age, the mere existence of bibliographic search service is insufficient; it must compete effectively with increasing alternatives. These analytical tools help library management understand the competitive landscape and establish the service's position of strength, using measured economic efficiency indicators (ROI) as marketing evidence (Syifaun, Nazilatul, & Nazrul, 2024).

5.1. Competitive Analysis:

Competitive analysis is essential for identifying the library's unique value proposition, as competitive threats come from varied sources:

- Direct Competitors: Institutions offering specialized search services targeting the same segment (e.g., academic consulting firms) competing for the same funding or time.
- Indirect Competitors: Alternatives that reduce the need for librarian intervention (e.g., Google Scholar, Generative AI tools capable of summarizing information, automated reference management systems).

Competitive Advantage Matrix: A systematic comparison is built between the library service and competitors based on three critical dimensions (Herminawaty, Muhlis, & Seri, 2024):

- Cost: Comparing the library's zero cost to the user (or cost embedded in institutional fees) with the high costs of commercial consulting services.
- Quality & Critical Depth: Comparing the reliability, accuracy, and critical analysis provided by the specialized librarian with the superficiality or errors from AI engines.
- Delivery Speed: Comparing library service speed, noting that automated tools may be faster, but the librarian provides "knowledge time" by delivering reliable, ready-to-use results.

5.2. Positioning Analysis:

Aims to determine how beneficiaries perceive the library service compared to other market alternatives.

- Perceptual Mapping: A graph that places the library and competitors on two-dimensional axes (e.g., High Quality/Low Cost) to determine the Optimal Position the library should occupy (often high quality for low cost compared to commercial competitors).
- Positioning Statement: Developing a clear message summarizing the library's unique competitive advantage (e.g., "Our bibliographic search service is the most accurate and reliable option, offering the highest ROI for your research time.") (Iza, 2019).

5.3. Segmentation and Targeting:

Given the variation in user needs, Market Segmentation is essential to efficiently direct resources for maximum return.

- Segmentation by Information Needs: Dividing the user base into homogeneous segments (e.g., Academics focusing on critical depth; Professionals focusing on timeliness; Graduate Students focusing on methodology) allows for customization of the marketing mix and concentrating librarian efforts on segments that yield the highest ROI.
- Differentiated Competitive Advantage: After segmentation, a customized advantage is defined for each target segment (e.g., Deep subject expertise for academics, Guaranteed quality/zero cost for students) (Tchai, Limor, & Uriel, 2023).

5.4. Data Utilization for Marketing Advantage:

Linking economic efficiency measurement to user behavioral data is the core of Evidence-Based Marketing in libraries.

- Data Mining: Used to analyze service usage logs and identify behavioral patterns indicating service success and value.
- Identifying Patterns Leading to Increased Use: Analyzing variables like "length of initial interview" or "access to specific databases" to determine which activities increase user satisfaction and repeat usage (Mohammed, 2024).
- Predictive Analysis: Identifying researchers likely to need intensive support and proactively offering the service.
- Utilizing Economic Efficiency Data (ROI) as a Marketing Tool: The measured ROI is the library's strongest evidence for reinforcing its market position.
- Highlighting Success Stories: Converting abstract figures into tangible Success Stories showing how the service "saved" researchers time, money, or a research project, using real monetary ROI figures.
- Financial Arguments to Management: Using a positive ROI as an irrefutable argument for demanding a budget increase, clearly demonstrating that the library is not a financial burden but a strategic, productive partner and a catalyst for productivity.

III. ANALYTICAL STUDY:

This section presents a detailed analysis of the theoretical factors, models, and key performance indicators required to assess the economic efficiency and competitive positioning of specialized bibliographic search services.

Table 1: Analysis of Theoretical Factors for Cost Measurement Methodology

Measurement Methodology	Theoretical Foundation	Analytical Perspective for Library Utilization	Competitive Marketing Advantage
Activity-Based Costing (ABC)	Modern Managerial Accounting; allocating costs based on resource consumption and productive activities.	Used to determine the true cost per unit of search, moving beyond traditional administrative cost distribution.	Provides quantitative proof of production cost, helping justify symbolic fees or

			demonstrate operational efficiency.
Total Cost of Ownership (TCO)	Microeconomics; calculating all direct and indirect costs of an asset/service over its lifecycle.	Ensures that database subscription costs and infrastructure depreciation are included in the service's total cost.	Helps compare the cost of "in-house produced" service with the cost of purchasing a similar ready-made service from the market.
Opportunity Cost	Economic Theory; the value of the best alternative foregone as a result of a specific choice.	Used to evaluate allocative efficiency: what value the library sacrificed by allocating librarian time to this search instead of another service.	Justifies investment in the most efficient service (highest return) as a strategic priority.

Source: Prepared by the Researcher

This table establishes the foundational methodological framework for evaluating service inputs by adopting three central economic tools. Activity-Based Costing (ABC) is the optimal tool for overcoming the shortcomings of traditional accounting in allocating indirect costs. Its analytical vision lies in determining the true cost per unit of bibliographic search service by linking consumed resources to the activities that produce them (e.g., librarian time, database usage hours). This precise cost determination is a direct competitive advantage, providing quantitative evidence that allows the library to justify its operational efficiency to senior management or in a marketing context to offer the service for a nominal fee that supports its quality.

The second tool, Total Cost of Ownership (TCO), ensures comprehensiveness in cost calculation by including all direct (salaries) and indirect costs (infrastructure depreciation, database subscriptions) over the service's lifetime. This enables the library to make a fair economic comparison between the cost of providing the service locally versus purchasing it as a ready-made market product. The third tool, Opportunity Cost, introduces a strategic economic dimension by evaluating the allocative efficiency of resources, identifying the value of the most profitable service sacrificed to offer the bibliographic search service. This analysis is crucial for guiding strategic decisions towards investing in services that achieve the highest institutional return and reinforce library priorities.

Table 2: Theoretical Model for Monetizing Qualitative Benefit (CBA)

Qualitative Benefit of Bibliographic Service	Proposed Practical Measurement Indicator	Prospective Vision for Translating Benefit into Monetary Value
Saving Beneficiary Time	Estimated surveys of saved work hours (academic or professional work hours).	Monetary Value Calculation: Multiplying saved hours by the researcher/consultant's estimated average hourly wage; this is the direct value of the "Economic Benefit."
Improving Decision/Research Quality	Citation Rate of the provided results, or the beneficiary's success in obtaining funding/publication.	Determining an additional value based on the beneficiary's success rate (a hypothetical formula linking search accuracy to the beneficiary's success percentage).

Reducing Information Risk (Error Reduction)	Indicators assessing the rate of encountering misleading or unreliable information if the search was conducted independently.	Calculated as "Loss Avoidance Value": Estimating the potential cost of a wrong decision based on poor information that was avoided thanks to professional search.
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Source: Prepared by the Researcher

This table addresses the challenge of measuring service outputs and converting their intangible qualitative benefits into a monetary value quantifiable within the ROI equation, with Cost-Benefit Analysis (CBA) as the enabling theoretical framework. Saving beneficiary time is the most significant and easiest economic benefit to monetize. This is prospectively achieved by using standardized surveys to estimate the hours saved for the researcher, then multiplying those hours by the beneficiary's average hourly work value (as a hypothetical wage), yielding the direct value of the economic benefit.

The more complex benefit, improving decision or research quality, can be measured by indirect indicators such as the Citation Rate achieved by library-supported research. The prospective vision here suggests a hypothetical formula to link search accuracy to the beneficiary's success rate, establishing an added value for the service. The table also introduces reducing information risk as a critical economic value, calculated as the Loss Avoidance Value: estimating the potential cost or loss avoided thanks to the rigorous professional search. This dimension is crucial for marketing the service's importance in professional or research sectors that demand accurate investment decisions.

Table 3: Theoretical Framework for Assessing Competitive Efficiency of the Service

Competitive Assessment Element	Library's Competitive Advantage (Vision)	Competitive Threat (Competitor)	Utilizing Measurement in Marketing
Output Quality	Human Reliability and Depth: Providing critical analysis, not automated aggregation.	Generative AI: Superior speed in initial aggregation (Speed threat vs. Quality).	Marketing the library as a "source of reliability" and "information auditor" that raises the user's ROI value.
Cost to Beneficiary	Free/Nominal: Low direct cost to the beneficiary due to institutional funding.	Commercial Institutions: Offering integrated, customized, high-fee packages (Customization threat vs. Cost).	Comparing the library's cost (ABC) with the commercial competitor's cost to justify the immense value offered for free.
Accessibility and Speed	Unified Access: A single gateway to all institutional databases and expert guidance.	Google Scholar: Instant response speed, no registration or authorization needed.	Investing measurement results to reduce the library's response time to narrow the speed gap with competitors.

Source: Prepared by the Researcher

This table offers a critical analysis of the competitive factors for bibliographic search service, focusing on defining the library's Competitive Advantage against the threats from AI and commercial competitors. The main library advantage lies in output quality, human reliability, and depth, which is the first line of defense against the speed-focused threat of Generative AI. Marketing efforts should leverage measurement results to position the library as an "information auditor and source of reliability," raising the user's ROI by mitigating risks associated with unreliable results.

Regarding Cost to Beneficiary, the library's advantage is its free or nominally-priced service due to institutional funding. However, this faces the threat of highly-customized, high-fee commercial institutions. Here, internal cost measurement (ABC) is utilized to justify the significant value the library offers for free, reinforcing its position as a superior economic efficiency choice. For Accessibility and Speed, despite the threat of Google Scholar's instantaneity, the library benefits from unified access and expertise in decoding proprietary sources. Prospectively, efficiency measurement results must be invested in reducing the library service's response time to close the speed gap with alternatives.

Table 4: Dual Key Performance Indicators (KPIs) (Economic and Marketing)

Indicator (KPI)	Dimension Measured	Analytical Vision for Utilization
Return on Investment (ROI) Ratio	Purely Economic (Material Efficiency).	Budget Justification: Every monetary unit invested in the service achieves an economic return exceeding its cost (e.g., 2.5 monetary units).
Beneficiary Loyalty Rate	Marketing (Service Sustainability).	Measuring the frequency with which beneficiaries repeatedly choose the library over competitors; an indicator of successful internal marketing.
Perceived Value Index (PVI)	Marketing/Qualitative (Perceived Quality).	Average beneficiary responses estimating the service's value if it were paid; used to determine the price gap.
Technical Search Success Rate	Operational/Efficiency	Measuring the percentage of searches that meet all specified requirements on the first attempt, reducing re-work and thus increasing efficiency.

Source: Prepared by the Researcher

This table identifies the Key Performance Indicators (KPIs) the analytical study should focus on to evaluate the service across two integrated dimensions: economic and marketing. At the forefront is the Return on Investment (ROI) Ratio, the pure economic indicator and the basis for budget justification. Its analytical vision is used to prove that every monetary unit invested in the service yields an economic return exceeding its cost, transforming the library from a cost center into a value producer.

On the marketing side, the Beneficiary Loyalty Rate is a crucial indicator, measuring service sustainability and successful internal marketing by tracking the frequency with which users choose the library over external competitors. The Perceived Value Index (PVI) complements this by assessing the service's perceived quality in the minds of beneficiaries, used to determine the gap between actual cost and user-perceived value, aiding in defining a compelling pricing strategy or justifying continued free service. Finally, the Technical Search Success Rate is an operational indicator focusing on internal efficiency by measuring the percentage of searches that meet requirements on the first attempt, reducing re-work and supporting economic value.

Table 5: Requirements for Building an Integrated Methodological Analysis Framework

Methodological Component	Required Tool	Key Analytical Challenge
Phase I: Input Measurement	ABC Model customized for bibliographic activities.	Accurate identification of Cost Drivers (e.g., complexity of request vs. search time).
Phase II: Value Measurement	Standardized surveys for Time Saved Estimation (CBA), and carefully designed WTP questions.	Avoiding bias in beneficiary responses when estimating the monetary value saved.

Phase III: Competitive Analysis	Comprehensive evaluation matrix including criteria for quality, speed, and cost for all competitors.	Reliable access to cost and pricing data for commercial competitors.
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Source: Prepared by the Researcher

This table defines the procedural steps necessary to ensure the effectiveness of the proposed analytical framework, focusing on the key methodological challenges to be addressed in each of the three measurement phases.

In Phase I (Input Measurement), a customized ABC model is required for the complexities of bibliographic services. The main analytical challenge is the accurate identification of Cost Drivers, as not all search requests consume resources equally, requiring differentiation between the cost of simple and complex requests. In Phase II (Value Measurement), relying on CBA tools and WTP surveys, the risk of bias in beneficiary responses is prominent, as the service is often free, necessitating intelligently designed surveys to mitigate this cognitive bias. In Phase III (Competitive Analysis), requiring a comprehensive evaluation matrix, the methodological challenge is to gain reliable access to cost and pricing data for commercial competitors, as this data may be confidential or require prospective estimation. The success of the proposed framework hinges entirely on the researcher's ability to overcome these challenges through the design of precise and reliable operational data collection tools.

Table 6: Suggested Marketing Strategies Based on Efficiency Analysis (Prospective Vision)

Suggested Marketing Strategy	Vision Based on Efficiency Measurement	Strategic Goal
Evidence-Based Marketing	Using high ROI value as an indicator of added value.	Transforming the perception of the library from a "support service" to a "value producer" worthy of strategic funding.
Quality-Targeted Marketing	Focusing on the competitive advantage being the librarian's accuracy (high reliability - Table 3).	Targeting researchers whose work demands highly authoritative sources where AI reliance is unacceptable.
Internal Marketing	Linking individual librarian performance to the cost savings ratio for the beneficiary (ROI).	Raising staff morale and professionalism and involving them in the process of justifying the service's value.
Service Expansion Strategy	Identifying service gaps (weaknesses) through Perceived Value analysis (Table 5).	Adding related services to achieve a more competitive "information package" (e.g., integrating search with reference analysis training).

Source: Prepared by the Researcher

This table offers a prospective reading of how to translate economic measurement results into rigorous marketing strategies. Evidence-Based Marketing (Strategy 1) relies on exploiting high ROI value as tangible evidence of added value, with the strategic goal of transforming the library's perception from a "support service" to a "value producer" deserving strategic funding. Quality-Targeted Marketing (Strategy 2) stems from the competitive efficiency analysis showing the librarian's superiority in accuracy and reliability, focusing marketing on the "librarian's accuracy" as a quality guarantee to target researchers who cannot tolerate the risks of error from AI. Internal Marketing (Strategy 3) addresses the human aspect, directly linking individual librarian performance to the cost savings ratio for the beneficiary (ROI), boosting morale and involving staff in the value justification process. Finally, the Service Expansion Strategy (Strategy 4) utilizes Perceived Value analysis results to identify service gaps, leading to the proposal of adding related services (e.g., advanced

training) to create a more attractive and competitive "information package" than the isolated bibliographic product.

Table 7: Competitive Positioning Analysis of the Service in Beneficiary Minds

Service Attribute	Desired Positive Perception (Required for Marketing)	Expected Negative Perception (Must Be Addressed)
Speed	A thoughtful, accurate service that prevents time wastage on future errors.	Slow compared to search engines and AI.
Value	A free or nominal reliable source that saves thousands of monetary units of researcher time.	An unnecessary service that can be dispensed with due to free alternatives.
Professionalism	A specialized consulting service that provides critical analysis of sources.	A routine service that merely aggregates sources the researcher could find themselves.

Source: Prepared by the Researcher

This table analyzes the crucial process of Competitive Positioning of bibliographic service in the minds of the target audience. It shows that each service attribute has a desired positive perception that must be marketed and an expected negative perception that must be addressed. For Speed, the negative perception (slow compared to a machine) must be transformed into the positive perception that the service is thoughtful and accurate, ensuring the user's time is not wasted later on error correction, thereby boosting the ROI value. Regarding Value, the service must be marketed as a reliable source that saves thousands of monetary units of researcher time (relative to the institutional cost) to counter the negative perception that it is "unnecessary" due to free alternatives. Finally, Professionalism must be marketed as a specialized consulting service that provides critical analysis of sources to counter the negative perception of it being a mere "routine" aggregation service, confirming that economic efficiency measurement is only complete if the library can translate measured economic benefits (like ROI and cost savings) into strong, distinct marketing messages that assert the service's necessity and strategic importance to the beneficiary.

Table 8: Prospective Model for Assessing Economic and Marketing Risks

Risk Type	Description	Potential Impact on Economic Efficiency (ROI)	Suggested Mitigation Strategy
Technological Obsolescence	The emergence of new AI tools offering high-quality source analysis.	A sharp decline in service demand, thus a drop in ROI due to suboptimal resource utilization.	Investing saved time in integrating AI technologies into the human search process.
Financial Pressure	Institutional budget cuts and inability to renew key subscriptions.	Increased unit cost (ABC) and greater difficulty in providing comprehensive service, weakening competitive advantage.	Developing hybrid business models including external partnerships or nominal fees.
Low Value Perception	The library's failure to market the value of time saved to beneficiaries.	Beneficiaries do not appreciate the true economic value of the service, leading to reduced loyalty.	Using case studies and ROI evidence as a core part of direct marketing materials.

Source: Prepared by the Researcher

This table offers a prospective view of the risks that could threaten the service's economic efficiency, suggesting methodological mitigation strategies. Technological Obsolescence is the most severe risk, where advanced AI could lead to a sharp demand drop and reduced ROI. The suggested mitigation is not resisting technology but integrating AI technologies into the human search process to increase the accuracy of human

output and reduce the cost (ABC). Financial Pressure (budget cuts) leads to increased unit cost and weakened competitive advantage. Mitigation requires developing hybrid business models involving partnerships or nominal fees to cover variable costs. The risk of Low Value Perception (failure to market true economic value) leads to reduced user loyalty. Mitigation involves using case studies and ROI evidence extensively in direct marketing materials to ensure the beneficiary is fully aware of the economic value they receive for free or for a nominal fee. Economic efficiency measurement is therefore a vital tool for risk management and ensuring future service sustainability.

Table 9: Dual Methodological Framework for Guiding the Analytical Study

Methodological Goal	Adopted Approach	Analytical Tools Used	Expected Analytical Output
Building the Theoretical Basis for Measurement	Analytical-Deductive Approach	Critical review of literature (Economics, Marketing, Information Science).	Determining the conceptual framework for ROI in information services and identifying measurement tools.
Formulating the Competitive Value Model	Prospective-Comparative Approach	SWOT Analysis, Competitive Positioning Analysis.	Designing the proposed operational framework for measuring economic efficiency in a competitive context.

Source: Prepared by the Researcher

This table defines the study's methodological framework as a "dual methodology" combining theoretical depth and prospective application. In Phase 1 (Building the Theoretical Basis for Measurement), the Analytical-Deductive Approach is used for critical literature review in Economics, Marketing, and Information Science. The expected output is the precise determination of the ROI conceptual framework in information services, establishing the theoretical foundations for measurement tools. In Phase 2 (Formulating the Competitive Value Model), the Prospective-Comparative Approach is used, applying tools like SWOT Analysis and Competitive Positioning Analysis. The expected output is the design of the proposed operational framework linking economic efficiency measurement to the competitive context. This table clearly outlines the study's research path, transforming theoretical goals into concrete methodological steps aimed at producing a fully integrated applied model.

Table 10: Prospective Vision for the Librarian's Future Role in Light of Economic Efficiency

Current Role	Main Challenge	Prospective Future Role	Required Skills
Bibliographic Search Service Provider	Competition with machines in source aggregation speed.	Knowledge Value Analyst and Source Auditor.	Financial analysis, Data analysis, Strategic marketing skills.
Database Supervisor	Pressure to reduce costs and increase subscription efficiency.	Information Portfolio Manager	ROI evaluation for subscriptions, economic negotiation, cost management.
Reference Expert	Underappreciation of the service's economic value by senior management.	Internal Efficiency and Productivity Consultant (proving service value with numbers).	Effective communication, strategic presentations, understanding business models.

Source: Prepared by the Researcher

This table offers a crucial prospective outlook on the future of the librarian profession under the imperative of proving economic efficiency, emphasizing that competitive and technological pressures will transform traditional roles into new strategic ones. The role of the Bibliographic Search Service Provider will shift from a mere source aggregator to a Knowledge Value Analyst and Source Auditor. This requires acquiring new skills outside the traditional scope, such as financial analysis, data analysis, and strategic marketing, to meet the challenge of automated competition. Similarly, the Database Supervisor, facing cost reduction pressure, evolves into an Information Portfolio Manager, a strategic task requiring ROI evaluation for subscriptions and economic negotiation. Finally, the Reference Expert will transform into an Internal Efficiency and Productivity Consultant, whose role will be to prove value with numbers to senior management. Success in this transformation depends not only on the accuracy of economic efficiency measurement (ROI) but on the librarian's ability to leverage these results through effective communication and strategic presentation skills, cementing the librarian's status as a strategic partner in achieving institutional economic goals.

IV. STUDY RESULTS:

- The study confirmed that relying solely on Total Cost of Ownership (TCO) is insufficient to justify the existence of bibliographic search service; instead, a shift to Return on Investment (ROI) measurement is required. The library must prove that the generated economic value (benefit) significantly exceeds the accounting costs (ABC), transforming it from a cost center into a strategic, value-producing partner within the parent institution.
- Analysis showed that Activity-Based Costing (ABC) is the most efficient methodology for measuring inputs, which is crucial for determining the true cost per unit of bibliographic search service. It allows for precise allocation of human and technical resource costs based on actual cost drivers (e.g., request complexity and time), providing essential quantitative data for sound administrative decisions and justifying (nominal) pricing strategies.
- The study concluded that saving beneficiaries' time and effort constitutes the most powerful and practical indicator for converting the qualitative benefit of the service into quantifiable monetary economic value that can be included in the ROI equation. It is suggested to leverage Cost-Benefit Analysis (CBA) tools to estimate the hours saved for the researcher and multiply them by the estimated value of their work hour, offering tangible proof of the generated economic value.
- Prospective analysis revealed that the primary and sole competitive advantage of professional bibliographic search service against Generative AI is the quality of outputs, reliability, and human critical depth in source evaluation. Marketing efforts must therefore focus on this dimension, positioning the librarian as an "information auditor and value analyst" who enhances the user's overall research efficiency and success.
- The results emphasized the necessity for libraries to adopt dual Key Performance Indicators (KPIs) that combine the economic dimension (such as ROI and Cost Per Unit) and the marketing dimension (such as Beneficiary Loyalty Rate and Perceived Value Index). This methodological integration ensures that quality and user satisfaction (marketing aspects) are not neglected in favor of cost reduction (economic aspects), leading to comprehensive and sustainable efficiency.
- The study highlighted the methodological challenge of cognitive bias when using Willingness to Pay (WTP) surveys to estimate perceived value. It confirmed that this tool must be used with extreme caution and standardized design, primarily to determine the gap between actual cost and perceived value, rather than for direct fee imposition, thereby supporting a value-based pricing strategy.
- The study projected that traditional marketing strategies are no longer effective. The alternative is adopting Evidence-Based Marketing, where the library must use its high ROI value (e.g., the library saved the institution X thousand monetary units) as direct material proof in marketing campaigns targeting senior management and beneficiaries, aiming to shift the institutional perception of the library from a cost center to an investment with a confirmed return.

- The results underscored the strategic value of including Opportunity Cost in the analytical framework, as it is the only tool that evaluates allocative efficiency of resources, helping management decide to allocate resources to the most productive services, thereby justifying investment in bibliographic search service over other services with lower economic returns.
- The prospective vision confirmed that economic and competitive pressures will transform the librarian's future role from a mere service provider to a Knowledge Value Analyst and Information Portfolio Manager. This requires educational institutions and libraries to invest in developing staff skills in financial analysis, data analysis, and strategic marketing to enable them to measure and justify the value of their services.
- The most comprehensive finding is that measuring economic efficiency necessitates an integrated methodological framework consisting of three sequential phases: (a) Input Measurement (ABC/TCO), (b) Output and Value Measurement (CBA/ROI), and (c) Competitive and Marketing Analysis. This framework ensures that the service evaluation process is comprehensive and objective, not merely measuring cost, but also proving value and competitive advantage in the digital market.

V. DISCUSSION:

The results demonstrate a radical shift in the conceptual framework for evaluating library services, confirming that survival and sustainability in the knowledge economy require replacing the traditional cost-based perspective with an ROI (Return on Investment) perspective. The finding regarding the necessary transition from TCO analysis to ROI measurement is not just a shift in a financial indicator; it is an acknowledgment that bibliographic search service is an investment asset that generates real economic value, primarily embodied in saving beneficiaries' time and effort—the benefit analysis proved to be the strongest and most monetizable indicator. This methodological shift necessitates precise cost determination via the ABC methodology, as knowing the true cost per unit is a prerequisite for maximizing return. These results reinforce the view that libraries must use economic tools as a defense and value-proving system to ensure sustained institutional support, moving away from being perceived as a cost item susceptible to reduction.

The results also highlight the existential marketing challenge imposed by digital competition. They confirm that the library service's competitive advantage does not lie in speed or accessibility, areas where automated tools and AI excel, but necessarily in the human reliability and critical depth of the librarian. This requires leveraging economic results to enhance this qualitative advantage. It is not just about measuring ROI, but about Evidence-Based Marketing; meaning the library must transform measured figures (like the monetary value saved for the institution) into strong, distinct marketing messages that solidify the service's position as an "information auditor and value analyst" rather than a "source collector." This process faces a methodological challenge in the difficulty of measuring Perceived Value (PVI), especially with the risk of bias when using tools like WTP, necessitating the design of standardized measurement tools capable of separating accounting value from the perceived value in the beneficiary's mind.

Methodologically, the findings affirm the necessity of adopting an integrated analytical framework that goes beyond unilateral measurement, as economic efficiency cannot be assessed in isolation from marketing efficiency. This justifies the need for dual Key Performance Indicators (KPIs) combining the financial dimension (like ROI) and the marketing dimension (like Beneficiary Loyalty Rate). This methodological integration ensures that service improvement is holistic, preventing the pursuit of cost reduction (ABC) from leading to a deterioration in quality and user satisfaction (Technical Success Rate). Moreover, including Opportunity Cost adds a strategic dimension to the analysis, as it is the sole tool that evaluates allocative efficiency of resources, answering the administrative question clearly: Is allocating librarian time to bibliographic search service the most efficient and economical choice for the institution?

The study projects a new professional role for the librarian, strongly imposing itself amid these changes. The results indicate that the librarian is no longer a mere information custodian but must transform into a Knowledge Value Analyst and Information Portfolio Manager. This transformation is the optimal strategy for facing the risks of technological obsolescence. Success lies not in competing with the machine on speed but in

integrating it and leveraging the time saved for more complex tasks requiring analytical and interpretative skills. These new roles necessitate acquiring skills in financial analysis, strategic management, and evidence-based marketing, transforming economic pressure from a job threat into an opportunity to redefine and develop the library profession to be more strategic and influential in institutional decision-making.

These results constitute a clear roadmap for libraries and information institutions. Proving the economic efficiency of bibliographic search services is a continuous, cyclical process requiring an integrated three-dimensional methodological framework that links (a) Accurate Cost Measurement, (b) Monetized Value Estimation, and (c) Competitive Positioning Analysis of the service. These results must be used not only to justify the budget but also as a powerful tool for Risk Management, particularly the risks of technological obsolescence and low value perception. The ability to prove that the service achieves a high ROI is the only guarantee for service sustainability and the enhancement of the libraries' strategic role in supporting the economic and research objectives of their institutions.

VI. CONCLUSION:

This analytical and prospective study concludes by affirming that the continuity of bibliographic search services amid current digital and economic transformations cannot be achieved with a traditional perspective but requires a radical shift in the conceptual framework for measurement and evaluation. The analysis proved the necessity of moving from viewing the library as a "cost center" subjected to financial reduction pressures to viewing it as an "investment center" that generates measurable economic value. The existential challenge posed by automated tools and AI cannot be met solely by increasing operational efficiency but requires proving economic efficiency by presenting material evidence that translates qualitative knowledge value (like accuracy and reliability) into a financial return (ROI). Therefore, adopting the dual methodological framework that links economic tools (ABC and CBA) with marketing tools (KPIs and Perceived Value) is a strategic necessity to ensure continued institutional support and guide administrative decisions toward optimal resource allocation.

The study provided an integrated operational framework to answer the main question, emphasizing that Activity-Based Costing (ABC) is the most effective tool for input measurement, allowing for precise allocation of unit costs for bibliographic search based on actual cost drivers, which is the logical basis for calculating the Return on Investment. In turn, Cost-Benefit Analysis (CBA) was identified as the pivotal mechanism for value estimation, especially by converting the qualitative benefit of saving researcher time and effort into tangible monetary value that strengthens the return equation. The study also clarified the importance of including Opportunity Cost as a strategic dimension to evaluate allocative efficiency of resources, placing the funding and investment process in libraries within the context of comparative economic decision-making within the parent institution.

Prospectively, the analysis revealed the critical competitive advantage of human search service, lying exclusively in quality, reliability, and critical depth in source evaluation. This advantage is the first line of defense against the speed threat posed by AI. Accordingly, leveraging economic efficiency measurement results (ROI) must be directed toward adopting Evidence-Based Marketing strategies, meaning converting measured figures (e.g., "The financial amount saved for the institution") into direct, compelling marketing messages targeting senior management and beneficiaries. This enhances the competitive position of the service and corrects the potential negative perception of the service (such as slowness or dispensability), firmly establishing the conviction that the librarian is an "information auditor and value analyst" rather than a mere source collector.

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