

Designing and Prioritizing Key Performance Indicators in Evaluating and Improving the Productivity of Special Libraries (the organization under study: Water and electricity industry of Iran)

Azim Azimi, Davood Nouri, and Maryam Fattahi

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Designing and Prioritizing Key Performance Indicators in Evaluating and Improving the Productivity of Special Libraries (the organization under study: Water and electricity industry of Iran)

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ABSTRACT

This research study aims to determine and prioritize essential performance criteria and indicators for evaluating and enhancing the productivity of special library services within the public sector's water and electricity industry of Iran. Focusing on the perspective of the Objectives and Key Results (OKR) system, we first addressed the pathology of library service quality. This was done by measuring the integrated LibQUAL service quality model and the Three-pronged model. BSC and PPM were applied to analyze management structures and library performance, forming the basis for identifying critical success factors and designing key performance indicators (KPIs). The Analytical Hierarchy Process (AHP) method played a key role in our evaluation, as it helped us to weight and rank a list of critical success factors (CSFs) according to success criteria (SC). In the following step, KPIs were designed and selected using the Six-step method proposed by Zis et al. (2023), based on these factors. The research findings revealed eleven critical success factors that influence the productivity management of libraries. The most significant criterion identified was the learning culture (95.0%), followed by customer satisfaction (72.0%), a positive experience (64.0%), and access to information resources (61.0%). Finally, seven key performance indicators for libraries were introduced as follows: satisfaction, net promoters, acquisition cost, repeat purchase/loan rate, customer experience, experience management, and customer churn rate.

Keywords: pathology, Objectives and Key Results, analytical hierarchy process, balanced scorecard, criteria and indicators, Performance Prism method

INTRODUCTION

Evaluating and measuring a process is vital for managing change and adaptation, as well as for performing effective operations. In this context, indicators and criteria are essential (Olazabal et al., 2024). As long as libraries as a living and dynamic organism are unable to measure their

activities effectively and do not use fact and figures to objectively assess the outcomes, they cannot provide the necessary elements, including statistical reports and justifications for their performance. This also involves securing reliable financial and physical resources. Without these measures in place, libraries will be unable to develop a clear vision or choose appropriate strategies and policies for the future.

Evaluation is essential for achieving excellence and improving any process, particularly in designing a roadmap. In this research, the roadmap which is linked to the goal-setting system of objectives and key results is aligned with the analysis of both the current and desired situations, as well as the gap analysis model. The key objectives and results approach serves as a roadmap in this research, highlighting the importance of employee motivation and its significant role in strategic management. This approach not only motivates employees but also enhance organizational vitality. It prioritizes crucial processes, allows for quick responses to environmental changes (agility), and significantly improves the company's capacity for development and progress (Xiang, 2023).

Objectives and key results are management tools that clarify goals and help achieve them (Xu, 2019). The purpose of implementing this system is to align the goals of the organization, team, and individuals in a structured and organized way, ensuring both horizontal and vertical alignment. This alignment will lead to measurable results, allowing all employees and processes to work together in a cohesive direction (Niven and Lamorte, 2016). The decision hierarchy tree structure in this research is based on a goal-setting system that outlines goals and key outcomes. In this design, the selected options are defined to align with the key outcomes and goals. The customer often assesses service quality by comparing service they received with what they expected. The aim of enhancing service quality is to bridge the gap between customer expectations and perceptions. The SERVQUAL model measures service quality by analyzing the gap between customer expectations and their perceptions. This model is also referred to as the gap analysis model (Parasuraman, Zeithaml, and Berry, 1985 and 1991).

The SERVQUAL model created in this study is based on the LibQUAL model. After assessing the current quality situation using the integrated model of the Performance Prism method and the balanced scorecard, we developed key performance indicators. We also assigned weightings and prioritized through analytic hierarchy process to enhance productivity.

The Performance Prism method is a performance management approach that effectively meet the needs of all stakeholders (Sari, 2015). To effectively measure organizational performance, it is essential to consider all stakeholders. This includes evaluating external metrics such as stakeholder satisfaction and participation, as well as internal metrics related to strategy, processes, and capabilities. It is important to assess both financial and non-financial metrics, as well as efficiency and effectiveness indicators. Therefore, who are the key stakeholders of the organization, and what are their specific demands and needs?

In this study, the literature section aims to differentiate and provide clear definitions of key concepts, such as “criterion” and “indicator”, along with examples, that are essential for this research. The aim of this research is to develop a process and conceptual framework that fosters scientific consensus using key performance indicators to enhance and achieve excellence in addressing a specific issue or variable. This framework can also guide and establish a consensus and method for researchers in a field of study, ultimately leading to successful research projects. This research specifically aims to address the following issues:

1. Establishing the success criteria for a project by developing a goal-setting system that includes objectives and key results;
2. Establishing and prioritizing critical success factors for library management and productivity through the implementation of an analytical hierarchy process, utilizing a goal-setting system of objectives and key results;
3. Identifying key performance indicators derived from the finalized critical success factors to assess library performance;
4. Develop and propose a process framework in similar studies to establish a standard implementation method that will contribute to the project’s success.

This framework assists researchers in organizing their studies more effectively from the beginning by providing a roadmap and implementing the concepts of strategic fit and alignment. Achieving these goals requires precise definitions and interpretations of key terms in the field of study.

LITERATURE REVIEW

Previous studies indicate that evaluating libraries requires multidimensional indicators and a combination of qualitative and quantitative methods. SERVQUAL and LibQUAL models have been widely used to assess service quality and user satisfaction, covering indicators such as customer satisfaction, positive experience, and access to information resources (Parasuraman, Zeithaml, & Berry, 1985; Isfandyari-Moghaddam, Razmi Shendi, & Norouzi, 2013). Additionally, frameworks like the Balanced Scorecard (BSC) and Performance Prism Method (PPM) have been applied to provide a comprehensive evaluation of both internal performance and stakeholder satisfaction (Sari, 2015). Quantitative approaches, including the Analytical Hierarchy Process (AHP) and the design of Key Performance Indicators (KPIs), have been employed to prioritize critical success factors and improve library productivity (Zis et al., 2023) (Previous studies are summarized in Table 1). These findings highlight that library evaluation should address both user-centered and organization-centered aspects to improve service quality and organizational performance.

Table 1
Literature Review (Previous Studies Tables)

| Year | Authors | Study Purpose | Method | Indicators / Tools | Main Findings |
|------|-------------------------------------------------|------------------------------------|--------------------------|----------------------------------------------------|--------------------------------------------------------------------|
| 1985 | Parasuraman, Zeithaml, & Berry | Assess library service quality | SERVQUAL | Customer satisfaction, service quality | Gap between customer expectations and received services identified |
| 2013 | Isfandyari-Moghaddam, Razmi shendi, and Norouzi | Assess university library services | LibQUAL | Satisfaction, positive experience, resource access | Improving user experience increases satisfaction |
| 2015 | Sari | Evaluate library performance | Performance Prism Method | Financial and non-financial metrics | Identified stakeholder needs and improved performance |
| 2016 | Niven & Lamorte | Implement OKR in libraries | OKR system analysis | Objectives and key results, performance indicators | Goal-setting system contributed to productivity improvement |
| 2019 | Vardeman & Wu | Evaluate academic libraries | LibQUAL | Resource access, satisfaction, user experience | Service quality positively correlated with user satisfaction |
| 2023 | Zis et al. | Design library KPIs | Six-step method | KPIs | Provided a practical framework for improving library performance |

Definitions and Terms

1. Indicator and criterion

An indicator is a tool used to measure and convert qualitative concepts into quantitative variables. An indicator is a quantity used to track the progress toward a specific goal. Indicators can measure various concepts, such as financial performance, customer satisfaction, and productivity. An indicator is a specific operational definition that outlines a particular criterion. A criterion is a quality used to evaluate how a variable performs in a specific domain.

In most speech and writing, the terms “indicator” and “criterion” are often used

interchangeably to refer to a measurement of a variable's stability. However, the term "indicator" is often used more broadly and encompasses quantitative measurements as well as narrative descriptions of significant issues and, in some cases, key aspects of an issue that require management. Conversely, the term "criterion" typically refers to qualitative or semi-quantitative measurements or indicators (Tanzil and Beloff, 2006). An "indicator" refers to a quality or characteristic that reveals a trend or demonstrates the effectiveness, progress, or success of something being measured. This could include changes in behavior, living standards or awareness. Although these factors can be measured, quantifying them is not straightforward. In contrast, "criterion" refers to a specific variable that can be clearly measured, such as the economic growth rate and per capita income (Tanzil and Beloff, 2006). Indicators and criteria are typically classified into two categories: single and composite.

To support effective decision-making, indicators and metrics must be connected to an organization's key objectives and crucial areas that need management (Tanzil and Beloff, 2006). This concept in the current study is grounded in the system perspective of objectives and key results.

2. Key Performance Indicators; Critical Success Factors; Key Success Factors and Success Criteria

In a system, key success factors are more important than critical success factors. Key success factors are strategic concepts that significantly influence an organization's competitive position. They are characteristics, conditions or variables that, when effectively managed, can lead to improved outcomes (Bruno and Leidecker, 1984). Critical success factors are elements that help predict the success of projects (Sanvido et al., 1992). Critical success factors are more limited and considered essential for an organization's strategy to achieve its goals. Key performance indicators are measurable metrics that indicate the success of a system in achieving specific goals. These factors should be audited at regular short-term intervals, typically every quarter.

Managers and experts use key performance indicators as essential tools to assess their progress toward success (Sari, 2015). They define the concepts upon which the solution set is developed, evaluated and adapted for other solutions. The use of key performance indicators is essential for benchmarking any operation or process. To effectively manage and improve operations, it is essential to measure their performance (Zis, Psaraftis and Reche-Vilanova, 2023).

To define and measure success in any project, it is important to identify several success metrics (Amora & Juanzon, 2022). Success metrics are tools used to measure how successful a process or system is. While critical success factors aid in achieving that success, fully identifying and evaluating both the critical success factors and the success criteria is essential to determine the overall success of a project (Jari, Pankaj, & Bhangale, 2013).

Success criteria should be agreed upon by all project participants before and during the project's implementation (Toor & Ogunlana, 2010). According to Turner (1999), if the success criteria are

not defined and identified at the beginning of a project, it becomes difficult to determine the critical success factors.

By addressing both concepts at the project's initial stage, its success and effectiveness can be achieved (Frefer et al., 2018). In this study, critical success factors have been developed according to 45 success criteria, drawing from the research of Amora and Juanzon (2022) as well as other studies. The most significant factors, along with their frequency rate, are presented in Table 2.

Table 2
Success Criteria Derived from Models

| Frequency (FR) | Success Criteria (SC) | Frequency (FR) | Success Criteria (SC) | Frequency (FR) | Success Criteria (SC) |
|----------------|-----------------------------------------------|----------------|---------------------------|----------------|------------------------|
| 16 | Learning Organizational Culture | 1 | Employee Engagement | 7 | Top Management Support |
| 12 | Information Needs | 5 | Ease | 9 | Reliability |
| 9 | Passion | 3 | Core Elements | 2 | Security |
| 12 | Cost – Program | 8 | Core Competencies | 5 | Responsibility |
| 11 | Quality – performance | 11 | Environmental impacts | 12 | Up-to-dateness |
| 8 | Satisfaction of other stakeholders | 5 | Willingness to buy/trust | 8 | Communications |
| 9 | Safety and health | 9 | Narrative recommendations | 7 | Objectivity |
| 6 | 9 Resource constraints | 9 | Personal attention | 5 | Courtesy and respect |
| 7 | Technology transfer | 10 | Innovation and diversity | 9 | Foresight and vision |
| 8 | Impact | 10 | Credibility and cost | 1 | Agility |
| 13 | Access to information and financial resources | 5 | Competence and relevance | 9 | External effects |
| 2 | Sustainability | 1 | Perception | 4 | Marketing activities |

| | | | | | |
|----|---------------------|---|-----------------------|----|------------------------|
| 14 | Positive experience | 9 | Technical performance | 15 | Customer satisfaction |
| 7 | Personal growth | 2 | Profitability | 9 | Value |
| 9 | Personal training | 3 | Visualization | 5 | Information technology |

3. Organizational Pathology and Service Quality Measurement (Models)

Organizational pathology involves applying behavioral science concepts and methods to define and describe the current state of organizations, aiming to enhance their effectiveness (Amora & Juanzon, 2022). Understanding service quality assessment models enables process owners to better identify opportunities for environmental improvement and leverage their competitive advantages in today's market (Irvani & Atashgar, 2015). Numerous models have been introduced to measure quality and improve productivity. These include the data envelopment analysis model, which measures the relative productivity of operating units; the multifactor productivity index; the total productivity index; the analytic hierarchy process; and the analytic network method. Both the analytic hierarchy process and the analytic network method are used to compare and prioritize key decision-making indicators. Table 4 presents several of these models. In this context, Tann (1993), quoting Brockman, (1997) points out that the quality of libraries should be measured against the following criteria:

- Understanding user needs;
- Providing optimal face-to-face and remote services;
- Seamless service delivery;
- Appropriate facilities and amenities;
- Acceptable interior space (furniture, lighting, heat, etc.);
- Appropriate reception and welcome;
- Reliable equipment (computers and other audiovisual resources);
- Efficient implementation management (effectively responding to questions);
- Knowledgeable and supportive staff;
- Appropriate support services;
- Monitoring user expectations, complaints, and constructive suggestions;
- Using feedback loops to improve weaknesses.

Currently, libraries are encouraged to implement performance evaluation systems based on output-oriented criteria, focusing on long-term results instead of relying resource and data evaluation indicators in a process-oriented manner (SERVQUAL). The objectives of this model are to assess

library service quality, create an evaluation mechanism for libraries, and identify the best in service delivery.

In this research, a qualitative assessment of the subject under study has been conducted based on the concepts of the dimensions of the 3P pathology model (Structural, behavioral, and contextual factors) and the LibQUAL model. Every field and survey research demands a mental map and a conceptual model that illustrates the variables and their relationships in a suitable analytical format (Najafizadeh and Zahedi, 2016). In this study, we utilized the 3P analytical tool as our conceptual model (Mirzaei Ahranjani and Amiri, 2002).

The conceptual model or theoretical framework should be illustrated as a schematic diagram (analytical model) to outline the number of variables and the relationships among them (Moghimi and Mirzaei Aharanjani, 2003). Therefore, the conceptual model for this research is represented using the 3P model and LibQUAL, showing how evaluation and productivity are interconnected (Figure 1). After gathering information about users' expectations and perceptions, the quality of service provided in the library is assessed.

This is accomplished through the gap analysis model, which evaluates the difference between users' expectations and their perceptions. The smaller the gap between these two factors in any given dimension, the higher the quality of services in that area; conversely, a larger gap indicates lower service quality. Based on the analysis results, we propose solutions to enhance service quality in each dimension. The key dimensions of this model are presented in Table 3.

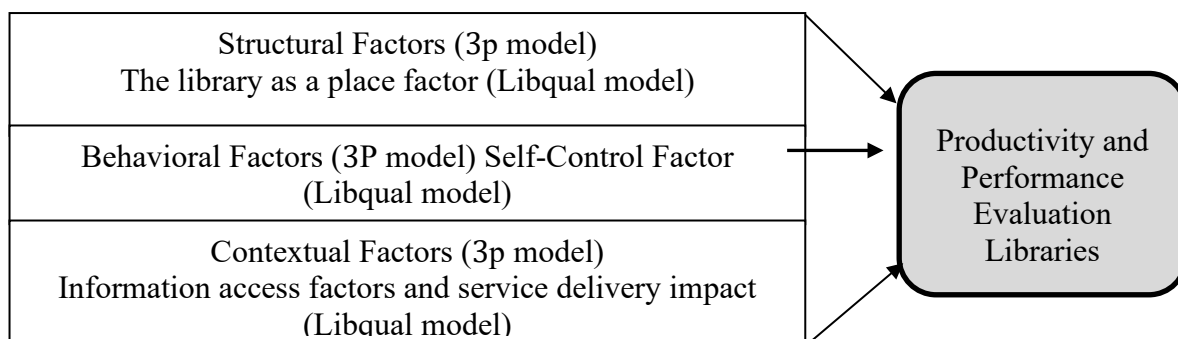
Table 3

Main Dimensions of the LibQUAL Model

| Components | Variables |
|------------|--------------------------|
| 9 | Affect of Service (AS) |
| 5 | Library as place (LP) |
| 8 | Information Control (IC) |

Figure 1

Conceptual Research Model based on the Dimensions of the 3P Model and the LibQual Model



4. Objectives and Key Results

One effective method for determining project success criteria for a project is the Objectives and Key Results (OKR) method, also known as the Acker model. The OKR method helps organizations achieve their business objectives effectively and efficiently by engaging employees (Niven and Lamorte, 2016). According to the John Doerr formula, the objectives and key outcomes are defined as: “The purpose of organization is ... measured by the...” Identify 3 to 5 core organizational objectives and identify 3 to 5 outcomes for each objective.

In this system of target setting, objective goals articulate our intended achievements, while key achievements specify the measurable actions required to attain those goals within a defined timeframe. Key results indicate how effectively we are meeting our goals. An acceptable score for each acre ranges from 0.6 to 0.7; if people consistently score 1, it indicates that their acre was not sufficiently ambitious from an organizational perspective.

The application of this method fosters transparency among teams, allowing them to be aligned and provide improved services (Choi & Jeong, 2019). The idea of goals and key results is a management system focused on objectives, featuring clear, specific, and comparable goals along with relevant performance indicators tailored to each situation (Khou, 2023).

A goal clearly defines what a team aims to achieve (Stray et al., 2022). A clearly defined goal should be achievable within three months timeframe and reflect both the team's and the organization's collective vision (Doerr, 2018). The OKR development process typically involves five key steps:

1. Developing objectives and key results.
2. Refining objectives and key results.
3. Identifying dependencies.
4. Presenting the results to superiors for final approval and publication (Choi & Jeong, 2019).
5. Implementing the approved objectives and key results, which will be detailed in the following sections (Xiang, 2023).

In this study, the key OKRs have been identified and achieved across three overarching goals, encompassing several specific key outcomes that serve as the basis for designing the performance indicators.

Objective 1: Increase the number of library visits and reading per person significantly:

- Key Result 1: achieve a 10% increase in customer satisfaction and loyalty by measuring the customer satisfaction index (statement item: How satisfied were you with your library visit

experience? If you were dissatisfied, please explain the reason) and Net Promoter Index (Declaration item: How likely are to recommend to other colleagues on a scale from zero to ten? Please explain your reasoning briefly).

- Key Result 2: achieve a 10% increase in monthly library visits by analyzing customer acquisition costs Index and the Repo Rate Index.
- $(\text{Marketing cost} + \text{Sales cost}) / \text{Number of new customers acquired} = \text{CAC}$
- $(\text{Total number of customers in the same time period} / \text{The count of customers who made more than one purchase during the same time period}) = \text{Repo Rate}$
- Key Result 3: Increase the lending of scientific and study resources by 10% each month by measuring the Customer Experience (CX) index and the Customer Experience Management Index.

Objective 2: Manage direct costs and general and administrative expenses:

- Key Result 1: A 10% reduction in costs by purchasing and equipping study spaces effectively;
- Key Result 2: A 5% increase in the annual budget will be allocated across the entire complex at the same rate through the operational budgeting index;

Objective 3: Improve user engagement:

- Key Result 1: Eighty percent of new members maintain their subscription after two months;
- Key Result 2: Half of all new users come back within two weeks;
- Key Result 3: Achieve a customer churn rate Index of less than 2% within three months. $(\text{Number of customers lost during a specified time period} / \text{total number of customers in that time period}) * 100 = \text{CCR}$;
- Key Result 4: Reduce the inactive rate of web-based users from 10 to 2%;
- Key Result 5: Increase the average weekly visits per active user from 11 to 22;

It is important to recognized that key performance indicators are a valuable tool for focusing on daily operations; however, they must be clearly distinguished from agreed-upon objectives and key results. A system of objectives and key results should concentrate on a small number of elements that can lead to sustainable improvements in system performance, according to Castro, Felipe, (2020).

5. Balanced Scorecard

Organizational performance measurement models, such as self-assessment excellence

models, the four-level performance pyramid model, and the balanced scorecard model by Kaplan and Norton (1996-2001), aim to offer a comprehensive and holistic view of organizational performance. These models consider various perspectives on performance to deliver a well-rounded assessment. Each indicator should be defined in accordance with the established goals and strategy derived from each approach's perspective. Table 4 illustrates an example of translating a selected strategy using a key performance indicator.

Table 4

Translating an Organizational Strategy into Operational Terms Using the BSC in the Present Study

| Initiative | Purpose | | | Index/ Measurement/ Criteria | Goals | strategy | scene |
|-----------------|-------------------|-----------------------|-------------------|------------------------------------|----------------------------------------------------------------------------------------------------|------------------|----------|
| | third year (%) | second year (%) | first year (%) | | | | |
| Loyalty program | 80 | 75 | 70 | Customer Satisfaction Score (CSAT) | <ul style="list-style-type: none"> • Leading in service • Customer loyalty | Increase quality | customer |

6. Analytical Hierarchy Process (AHP)

This study utilized the Analytical Hierarchy Process, a statistical tool developed by Thomas L. Saaty in 1980. This method, based on the analysis of the human brain for fuzzy problems (Asgharpour, 2009), serves as an effective, flexible, and powerful tool for decision-making regarding complex issues, assisting the decision-maker in determining priorities and achieving optimal outcomes (Saaty, 1980). In this study, AHP was used to calculate the weight of each option in decision-making situations. The data collection tool used in the analytic hierarchy process method is an expert questionnaire designed as a series of statements in this study. The process of applying this method involves several clear steps, which are outlined below (Juanzon, 2019 and Eric & Juanzon, 2020):

1. Define research objectives and determine metrics;
2. Pairwise comparison of both competitors;
3. Develop a series of $n \times n$ pairwise comparison matrices for each criterion or option at the lower levels of the hierarchical structure.

The comparisons assess the significance of elements and the frequency of a key component. The proposed hourly priority scale has been utilized to compare the elements mentioned above, as illustrated in Table 11 (Habibi Badrabadi and Mohammadi Moghaddam, 2011). The score for each option is calculated by summing the products of its priority based on criterion i and the priority of that criterion.

The steps of the analytic hierarchy process in this research are as follows: first, we collect questionnaires and calculate the compatibility rate. Next, we design a hierarchical tree and perform pairwise comparisons. Finally, we combine the gathered opinions and generate a report using Expert Choice software. After conducting the pairwise comparisons, the next step is to determine the final priorities for each option.

METHODOLOGY

The current study is applied, descriptive, and uses survey methods for data collection. It employed a mixed method approach that integrates both quantitative and qualitative elements. This research is structured around the key goals and outcomes, utilizing two comprehensive approaches: pathology (the current state) and index design for improvement and excellence (the desired state). The research is organized into four comprehensive research steps, encompassing twelve main activities (Figure 2).

A roadmap was developed using the goals and key results model. This guide serves as the foundation for the first step, which involved evaluating the current state of pathology based on the quality of service model and a three-pronged approach. Key success factors were identified through a literature review, theoretical analysis, and expert opinions. These factors were then classified, summarized, and assigned an important coefficient to highlight their significance in the phenomenon under study.

From the scores, the key initial factors influencing library service quality were identified. Based on the results, eleven critical success factors were identified under three main branches: economic, social, and environmental criteria related to evaluating and enhancing productivity using the Analytic Hierarchy Process based on Success Criteria. After analysis based on the method by Zis et al. (2023) and weighting according to the Nunley spectrum, seven key performance indicators were identified as critical percentages.

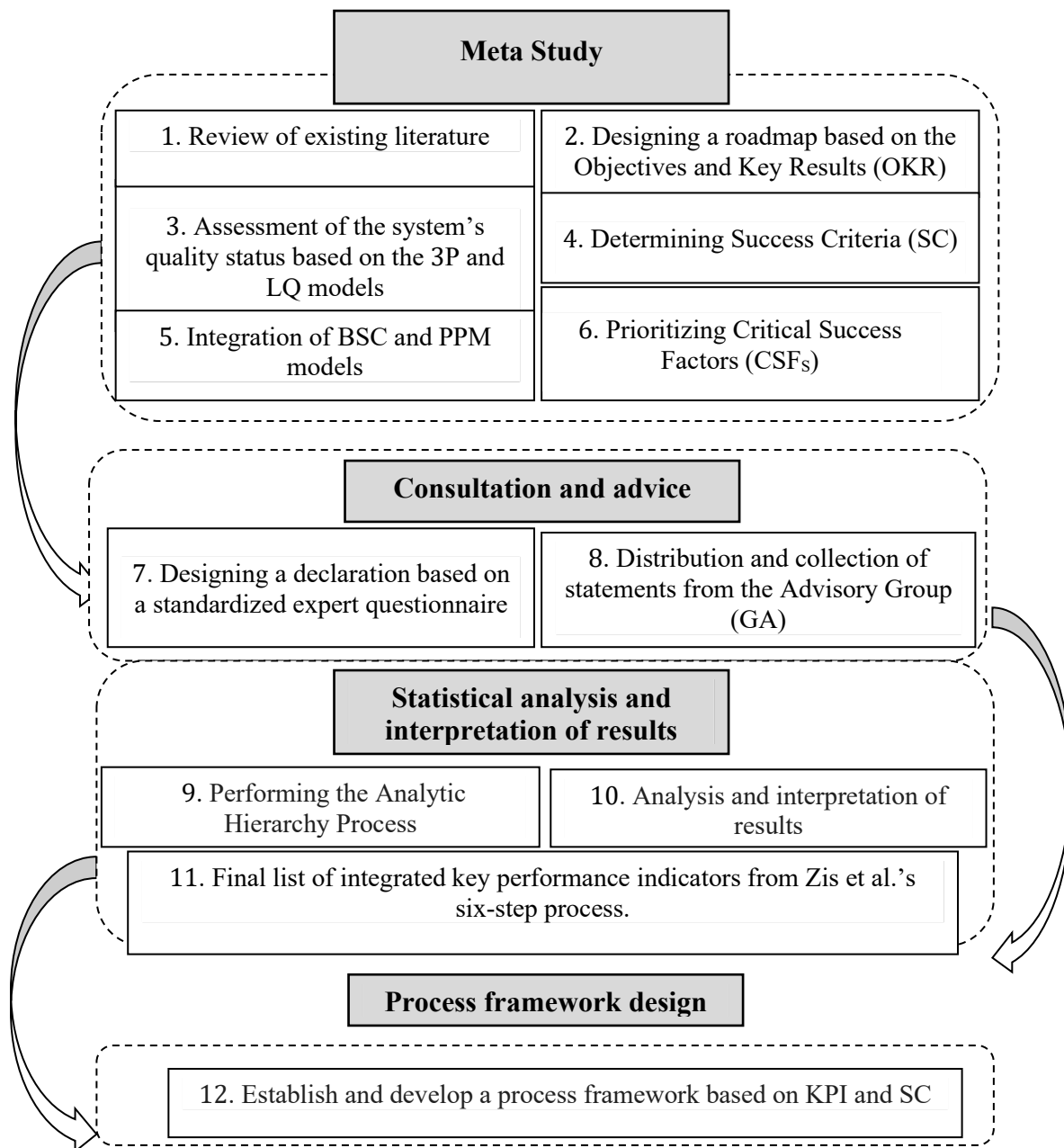
The key performance indicators from the Zis six-step process are the metrics on which the solution set is evaluated and selected. These should be measured during the performance evaluation process. To conduct the initial analysis and establish a list of success criteria, a data template based on a researcher-made declaration was distributed to most stakeholders. Necessary initial information was gathered through open interviews and a meta-study. The complete template contained a total of 75 fields for completing information.

The design of key performance indicators was conducted using a combination of balanced scorecard and performance charter methods, along with the analytic hierarchy process to determine the weight of integrated key performance indicators. This section summarizes three groups of key performance indicators, followed by a quantitative framework for calculating each indicator and the associated data required:

- a. Economic key performance indicators primarily focus on aspects related to time and cost.

- b. Environmental key performance indicators are primarily related to the consumption of light and energy, as well as the surrounding environment, including sound, layout and arrangement.
- c. Social indicators, specifically social key performance indicators, are mainly qualitative metrics with predetermined values, such as studies conducted on a per capita basis. Table 6 summarizes the key performance indicators chosen to evaluate the triple issues.

Figure 2. Research Process Framework



AHP Process Stages

Goal Level

Enhance the productivity of special libraries in the water and electricity sectors.

Criteria / CSFs (Critical Success Factors, 11 factors):

1. Learning culture (95%)
2. Customer satisfaction (72%)
3. Positive experience (64%)
4. Access to information resources (61%)
5. Updatedness of information resources
6. Program cost management
7. Reliability
8. Information needs
9. Environmental impacts
10. Quality-performance
11. Innovation and diversity

Alternatives / KPIs (7 final indicators)

1. Customer Satisfaction Index (CSAT)
2. Net Promoter Score (NPS)
3. Customer Acquisition Cost (CAC)
4. Repeat purchase/loan rate (Repo Rate)
5. Customer Experience Index (CX)
6. Experience Management Index (CEM)
7. Customer Churn Rate (CCR)

Weighing:

The weight of each CSF was extracted from Table 12.

Percentages have been adjusted to ensure compatibility with Expert Choice software.

Explaining AHP diagrams

The pie chart of Critical Success Factors (CSFs) and the bar chart of Key Performance Indicators (KPIs) (Figures 3-6) together provide a comprehensive view of the relative importance of each element in the success of libraries. According to the results, Learning culture with a weight of 95% among the CSFs, and Repetition Rate (Repo Rate) with 95% among the KPIs, hold the highest positions. This indicates that the sustainability and success of knowledge organizations depend both on strengthening an internal culture of learning and on maintaining user loyalty. Following these two key factors, elements such as Customer satisfaction (72% in both categories), as well as Positive experience and the Customer Experience Index (CX) with weights above 60%, occupy the next ranks. Other criteria such as Access to information resources, data updatedness, cost management, along with KPIs like CAC and NPS, although ranked lower, still play a complementary role in enhancing the overall performance of the organization.

Figure 3
AHP Final Weights of KPIs

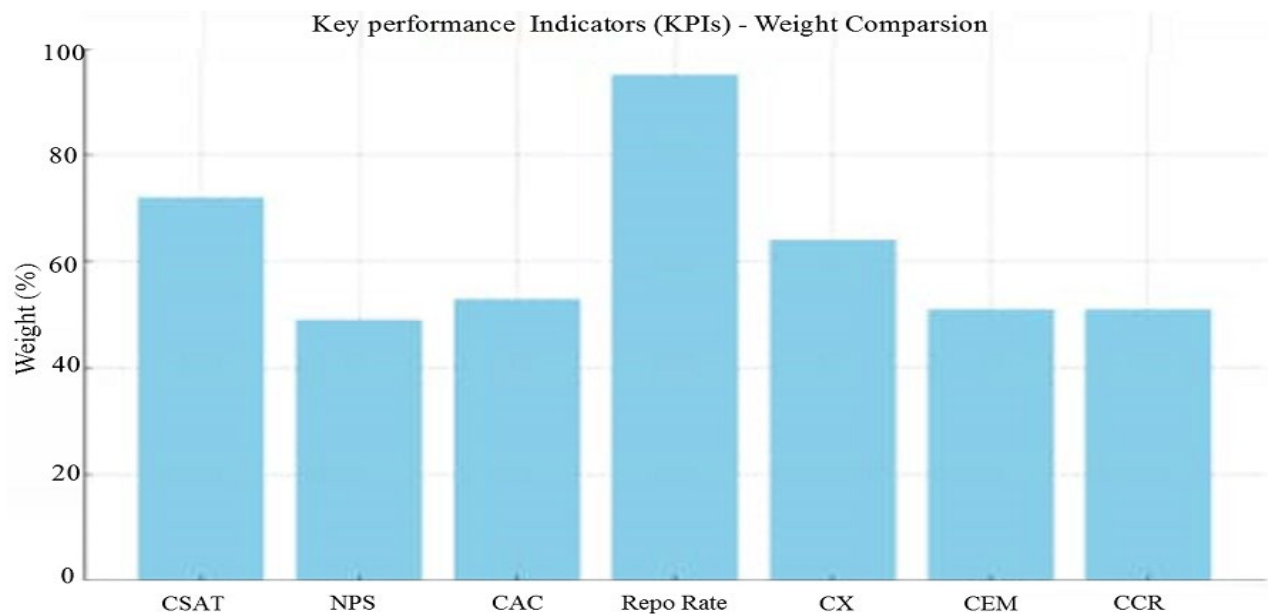


Figure 4
Key Performance Indicators (KPIs)- Weight Comparison

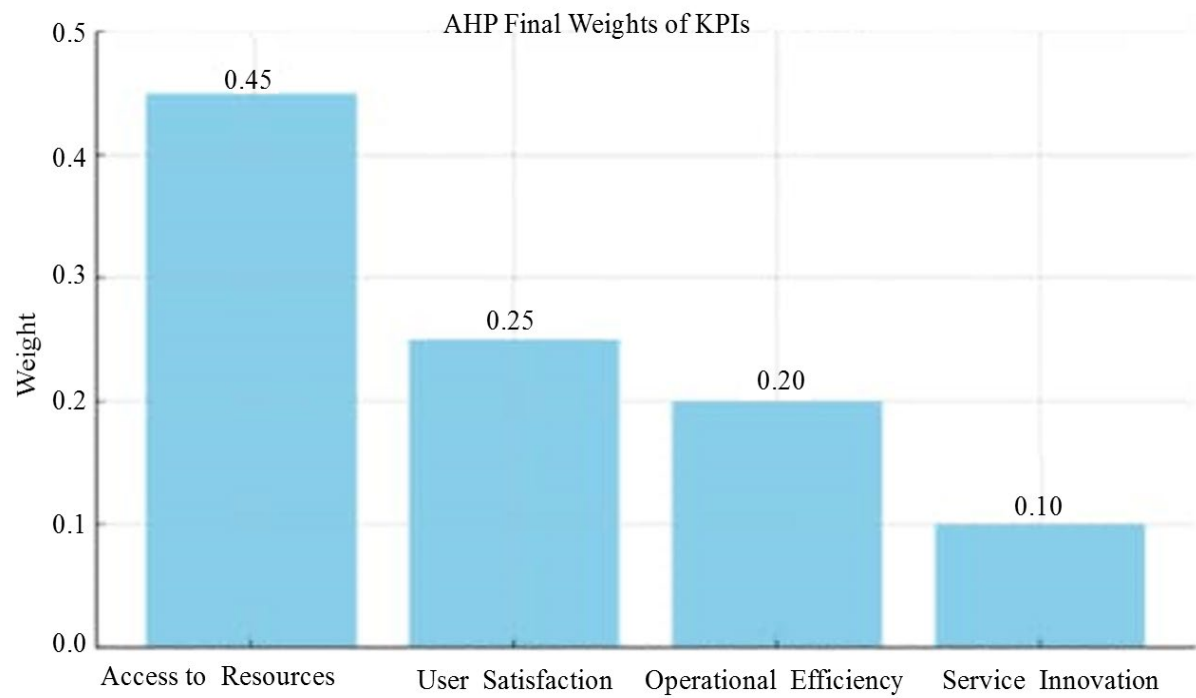


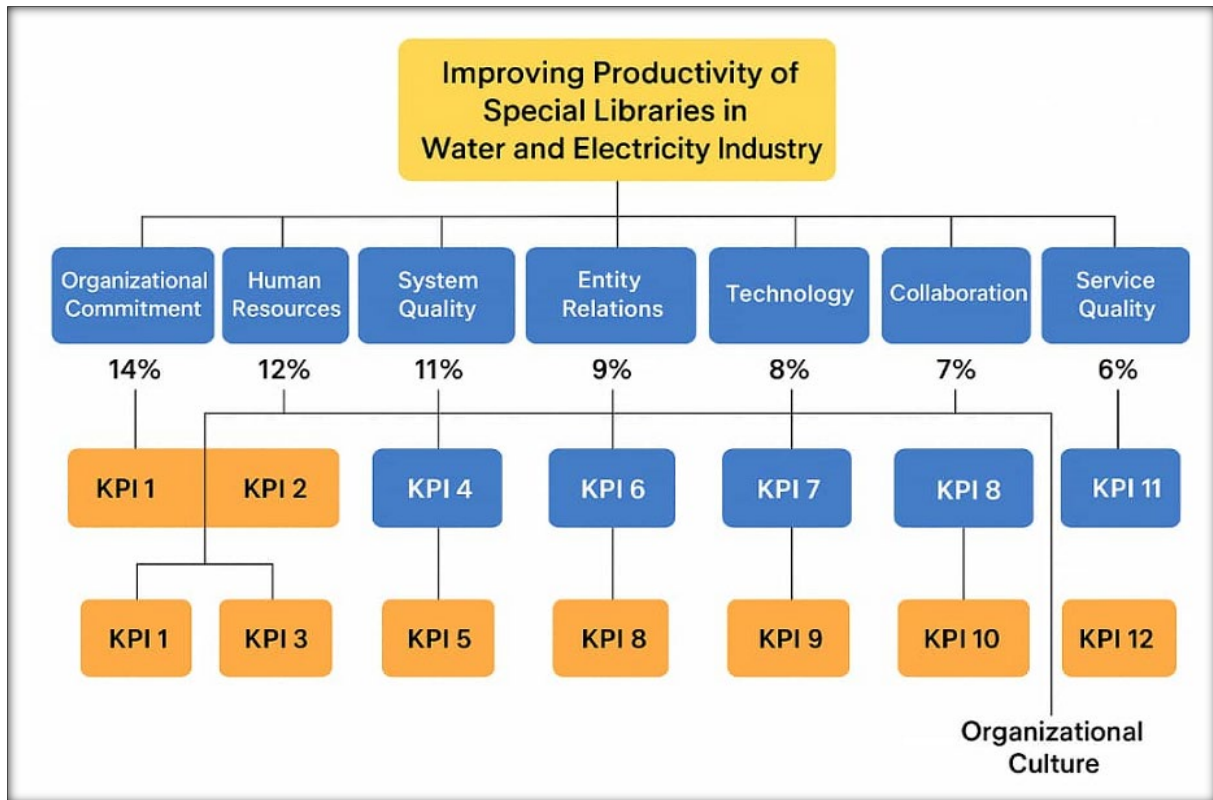
Figure 5*Improving Productivity of Special Libraries in Water and Electricity Industry*

Figure 6
Critical Success Factors (CSFs)-Weight Distribution

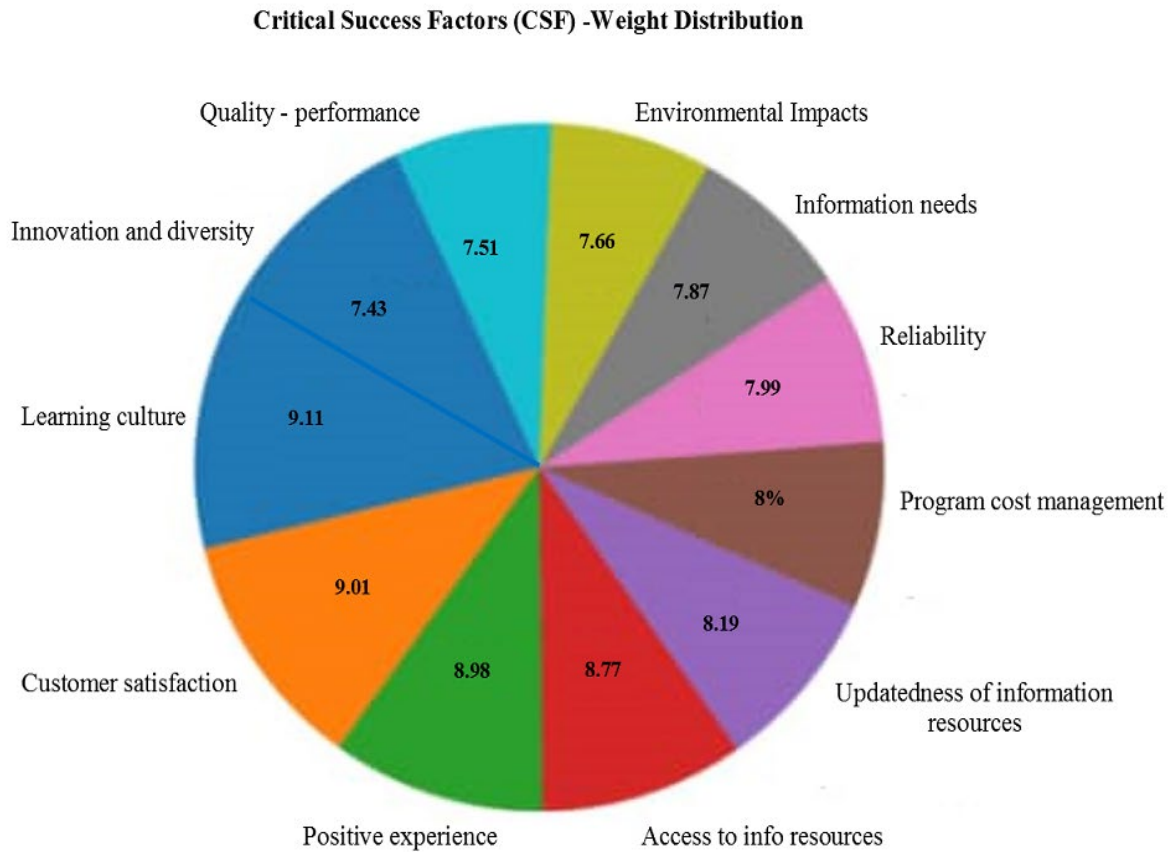


Table 5
Zis' Six-step Process for Designing KPIs Based on BSC and PPM Dimensions

| Steps | Description |
|-------|------------------------------------------------------------------------------------------------------------------|
| 1 | Systematic review of previous studies and research projects that utilized KPIs to assess the system performance. |
| 2 | Provide an initial list of potentially potentially relevant KPIs that could be useful for benchmarking purposes. |

| | |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Distribute a questionnaire or researcher-made statement to relevant stakeholders and members of the Advisory Group (AG), including the initial list of KPIs from Step 2, and gather their feedback and critiques. |
| 4 | Expand the list of KPIs based on previous feedback and discussions. |
| 5 | Establish a final list of KPIs by weighting and scoring using the Nanley spectrum, as agreed by the Advisory Group (AG). |
| 6 | Provide a final consolidated list of KPIs based on all critical inputs received in the earlier stages. |

Table 6

Summary of Selected Key Performance Indicators in the Evaluation of the Triple Issues Based on the Zis Model (2023)

| Economic Indicators | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------|
| Description | Title | Type |
| Expenses incurred to maintain accurate and reliable operations associated with an asset | Purchase and maintenance | Cost |
| The time spent accessing and obtaining resources and study places | waiting time | Time |
| Environmental Indicators | | |
| Description | Title | Type |
| Safety and health involve Unexpected accidents and movement, as well as access to resources and study places, including order in archives and shelving | Unexpected events and relocation | Safety and health |
| Noise pollution, appropriate and optimal light, favorable air and appropriate temperature | Light, sound and temperature | Health |
| Social Indicators | | |
| Description | Title | Type |
| Average study duration or number of study sources per person, per day | Per capita study | Referral rate |
| based on current knowledge and the science cycle | knowledge management | Up-to-date |

FINDINGS

In this study, we aimed to collect information and assess the desirability of the indicators derived from the researcher-made declaration based on an expert questionnaire. The statistical population consisted of 30 managers and experts from the Ministry of Energy, as determined using Sample Power version (3) software. The Nunley evaluation spectrum was utilized to calculate the average desirability score of the indicators obtained from the researcher-made declaration. Nanley developed a four-point spectrum Table 7 to indicate the degree of desirability of scores obtained from five-point Likert-scale questionnaires. In discussions that involve large amounts of data, personal opinions are less significant. Systematic reviews facilitate the careful examination and evaluation of evidence (Hall, 2013). By distributing a standard questionnaire consisting of 50 questions from the three-pronged model, the required data for information analysis was gathered. Inferential statistical techniques (such as multivariate regression analysis and Pearson's correlation coefficient) were then used for analysis. In order to ensure the reliability of the questions relating to each of these hypotheses, Cronbach's alpha was calculated separately for each of them, as shown in Table 8.

Table 7

Nanley Evaluation Spectrum

| 5 - 4 | 3/99 – 3 | 2/99 – 2 | 1/99 – 1 | Standard |
|-----------|------------------|--------------------|-------------|----------|
| Desirable | Fairly Desirable | Fairly Unfavorable | Unfavorable | |

Table 8

Cronbach's Alpha Hypotheses

| Order | Independent and Dependent Variables | Cronbach's Alpha Coefficient | Principal Components |
|-------|-------------------------------------|------------------------------|-----------------------|
| 1 | Evaluation and Productivity | ./787 | Economic Factors |
| 2 | | ./884 | Environmental Factors |
| 3 | | ./901 | Social Factors |

For the quantitative analysis, inferential statistical indicators from the Nanley utility spectra, Friedman's test, and independent group t-test were used. As shown in Table 9, the average of all model dimension categories is below the theoretical average in Table 10 and according to the Nunley spectrum, all indicators are in a relatively unfavorable or completely unfavorable condition. Given the significance level of 0.05, these results can be generalized to the whole public sector with 95% certainty.

Table 9

Current Status of Knowledge-based Processes in the Organization Under Study in the Three Dimensions of the Model

| Friedman test | | Status based on the Nunley spectrum | Lower limit of the average in the community | Upper limit of the average in the community | Dimensions or micro-components |
|---------------|----------------|-------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------|
| Sig | X ² | Unfavorable | 1.77 | 2.05 | Learning culture |
| 0/001 | 57/901 | Unfavorable | 2.03 | 2.32 | Customer satisfaction |
| | | Rather unfavorable | 2.58 | 2.89 | Positive experience |
| | | unfavorable | 2.16 | 2.39 | Access to information resources |
| | | Rather unfavorable | 2.12 | 2.27 | Timeliness of information resources |
| | | Rather unfavorable | 2.19 | 2.90 | Program cost management |
| | | unfavorable | 2.09 | 2.18 | Reliability |
| | | Rather unfavorable | 2.20 | 2.40 | Information needs |
| | | unfavorable | 2.19 | 2.88 | Environmental impacts |
| | | Rather unfavorable | 1.99 | 2.09 | Quality-performance |
| | | Rather unfavorable | 1.90 | 1.99 | Innovation and diversity |

Table 10

Prioritization of Critical Success Factors (CSFs) on Knowledge-based Programs in the Studied Public Sector

| Quality | average rank | rank | X ² -square coefficient | Significant level |
|--------------------------------------|--------------|------|------------------------------------|-------------------|
| Learning culture | 9.11 | 1 | 57.901 | 0.001 |
| Customer satisfaction | 9.01 | 2 | | |
| Positive experience | 8.98 | 3 | | |
| Access to information resources | 8.77 | 4 | | |
| Updatedness of information resources | 8.19 | 5 | | |

| | | | | |
|--------------------------|------|----|--|--|
| Program cost management | 8 | 6 | | |
| Reliability | 7.99 | 7 | | |
| Information needs | 7.87 | 8 | | |
| Environmental impacts | 7.66 | 9 | | |
| Quality - performance | 7.51 | 10 | | |
| Innovation and diversity | 7.43 | 11 | | |

Regression analysis helps to determine the influence of independent variables on the prediction of a dependent variable. In a regression analysis, the goal is to predict changes in a dependent variable by the changes in the independent variables (Sadghiani and Dehghan, Navabi Zand, 2011). Multivariate regression analysis is well suited to study the effect of multiple independent variables on a single dependent variable. The results from the final stage of the regression analysis are presented in Table 11.

Table 11

Results of Stepwise Multivariate Regression Analysis Regression Analysis of Three Independent Variables from Pathology Variable

| Test result | sig | B | function | Triple independent variables from pathology | | Regression analysis |
|------------------------------|----------------------------------------------------------|-------|--------------|---------------------------------------------|-----------------------|---------------------|
| Acceptance of H ₀ | 0/000 | 0/136 | Productivity | Purchase and maintenance | Economic factors | |
| | 0/001 | 0/114 | | Cost - program | | |
| | 0/000 | 0/078 | | Income - performance | | |
| | 0/001 | 0/189 | | Per capita studies | Social factors | |
| | 0/001 | 0/177 | | Communications | | |
| | 0/000 | 0/111 | | Learning culture | | |
| | 0/001 | 0/161 | | Light, sound and temperature | Environmental factors | |
| | 0/001 | 0/145 | | Physical resources | | |
| | 0/001 | 0/170 | | Distance dimension | | |
| | P<0/01 , P<0.05 F= 93.27 , R2=0.504 | | | | | |

The interpretation of the resulting regression function is that the contribution of three-dimensional model is considered in the order of the fourth column in the table above. For

example, any change in a unit in the economic dimension of purchases and maintenance will result in a change in productivity of at least 0.136. Similarly, for every unit change in the cost quality dimension of the programme, productivity changes by 0.114. The effects of other dimensions follow the same pattern in order of importance. Table 12 shows the relative importance of the final KPIs resulting from the integrated model of BSC and PPM in the analytical hierarchy framework.

Table 12***Ranking of Final Indicators from the Integrated BSC and PPM Model***

| Weighted score of options in terms of the relevant indicator (weight and rank) | Compatibility rate | Total importance | Objectives of decision indicators and their importance coefficients based on the integrated model of the balanced scorecard and the performance charter | | | | | Purpose |
|--------------------------------------------------------------------------------|--------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------|-----------------|----------------------------------------|--------------------------------------------------------------|
| | | | Selected idicator | Decision criteria based on success criteria | | PPM | BSC | |
| 0/53 | 0/01 | 0/108 | Customer Acquisition Cost Index (CAC) | Cost - Program | Economic | Ability (0/33) | Financial field (0/27) | Ranking and determining the relative value of each indicator |
| 0/45 | 0/02 | 0/0729 | | Quality - Performance | | | | |
| 0/61 | 0/03 | 0/0891 | | Access to resources | | | | |
| 0/72 | 0/01 | 0/1302 | Customer satisfaction index (CSAT) | Client satisfaction | Environmental | Strategy (0/40) | Market and customer field (0/31) | |
| 0/49 | 0/01 | 0/0775 | Net Promoter Index (NPS) | Innovation and diversity | | | | |
| 0/49 | 0/02 | 0/1023 | | Environmental effects | | | | |
| 0/95 | 0/02 | 0/136 | Repetition rate index (Repo Rate) | Learning culture | Social | process (0/32) | The field of internal processes (0/20) | |
| 0/64 | 0/01 | 0/064 | Customer Experience Index | Positive experience | | | | |

| | | | | | | | | |
|--------|----------------------------|--------|---------------------------------------------|----------------------|-------------|-------------------------|-------------------------------------|--|
| | | | (CX) | | | | | |
| 0/51 | 0/02 | 0/0616 | Experience manageme nt index (CEM) | Reliability | | | | |
| 0/51 | 0/00 | 0/066 | Customer churn rate index (CCR) | Information needs | Combination | Participation (0/30) | Area of growth and learnin | |
| 0/55 | 0/01 | 0/0924 | | being up to date | | | | |
| 0/5781 | Weighted average of scores | | | | | | | |

The results are presented in the table above, based on the available data and analysis conducted using Expert Choice software. The ranking of the different KPIs was done on the basis of 11 critical success factors, each assigned a specific importance coefficient. Finally, seven final KPIs were identified through weighted averages and rankings.

CONCLUSIONS AND SUGGESTIONS

Influencing indicators in this study have been identified and prioritized after diagnosis of the current situation and design of the desired situation, using a goal-setting system and key outcomes, and hierarchical analysis process. It is recommended that the established criteria and indicators be reviewed and audited on an annual basis. Among the most important of these criteria and factors, based on the three dimensions of economy, social, and environment, a number of items may be mentioned, such as the culture of learning, followed by customer satisfaction, positive experiences, and access to information. Identifying these factors will lead to the development of effective solutions for improving the quality of services provided in these complexes in the management and planning process. In recent decades, libraries have had a high standard of quiet, noise-free spaces, food and beverage free areas, a repository and bank of books and other information sources, large halls filled with libraries, loan desks, encyclopedias, and limited social spaces. Based on these characteristics and on qualitative and subjective criteria, their evaluation process has also been defined. Today, visiting a library is no longer just about accessing information and resources from the past. You can easily find the information you need by searching virtual spaces or by browsing the internet with a single click.

What still makes libraries a desirable destination is the growing desire to be in places where, while meeting academic needs, they can also be a venue for cultural activities and social participation (taking into account both technical and social needs). Libraries have now moved from collection-centric to customer-centric approach, with a strong focus on the quality of services to

increase users' satisfaction (Isfandyari-Moghaddam, Razmi shendi, and Norouzi, 2013). Architecture and building play a key role in all human developments, and the spatial dimension is a key aspect reflecting the changing processes in libraries. As libraries are now considered part of the educational, recreational and information infrastructure of each country, it is proposed that organizations, apart from having precise criteria and indicators to assess the quality of their services, should also identify the pathology of the complex and move towards modern study spaces, using natural light and recyclable materials, with a focus on energy management principles (Rubin, 2010). The existence of in-house learning programs, such as study camps/tour can also be effective in increasing per-capita learning of staff. Study camps refer to an organizational plan for the presence of all company employees in the organization's library or other organizations with the aim of motivating, encouraging, and informing them about the knowledge resources available in that collection (this process can even be placed on the organization's agenda under compulsion). In order to promote environmental protection and sustainable development, particular attention should be paid to digitization, to creating open access to information and library resources, and to developing a green library concept, with a focus on empowering indicators and criteria.

The key findings and main achievements of this study can be summarized as follows: by identifying eleven critical success factors and developing seven key performance indicators, it provides a comprehensive framework for evaluating and enhancing the productivity of specialized libraries in Iran's water and electricity industry. The main achievement of the research is highlighting the crucial role of learning culture, customer satisfaction, and customer experience in improving library service quality, while also introducing practical indicators for continuous performance monitoring. These findings offer both a scientific and practical foundation for managerial decision-making, designing innovative strategies, and guiding libraries toward becoming more dynamic and user-centered in the future.

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