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Multidisciplinary ⋮ Rapid Review ⋮ Open Access Journal

Multi-Criteria Decision Analysis of Project Management Competencies — A Case Study of Pakistani Non-Governmental Organizations (NGOs)

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ABSTRACT A structured and specified project management competency framework plays a significant role in accomplishing the goal of non-governmental organization in line with its mission and strategic plan. However, constrained resources and extended requirements from the donors and stakeholders in non-governmental organization (NGO) in Pakistan emphasize the necessity of a tailored, adaptable project management competencies framework to meet project requirements. Considerations have been given to project managers' competencies in prior literature. Still, limited study exists on identifying the project management competency dimensions, especially in the NGO sector of Pakistan. In this research, we have studied the project management competencies, dimensions "Strategic and Business Management", "Leadership" and "Technical Project Management". Keeping in view the expertise and diversity, the opinions of subject matter experts from NGO sectors across Pakistan was taken. The data was collected through the questionnaire using pairwise comparison and analyzed by using the Analytical Hierarchy Process (AHP), which falls under the umbrella of MDCM. The results of the study of the NGO sector concluded that the competency dimension "Strategic and Business Management" has the most significance, followed by "Leadership and "Technical Project Management". In the hierarchy of the competencies by their global weights is as follows, Strategic Planning Alignment has the most significance, followed by Problem Solving, Customer Relationship and Satisfaction, Cost Estimation/Budget, Project Management Tools and Technique, Team Building, Benefits Management Realization, Market Awareness, and Condition, Coaching and Mentoring, Schedule Management, Verbal, and Written Communication and Listening.

INDEX TERMS AHP, Multi Decision Criteria Method, NGO sector in Pakistan, Project Management, Project Management Competencies,

I. INTRODUCTION

Due to the Project Management talent gap, a potential loss of up to "US$345.5 billion" in global GDP is expected by the year 2030. The recent Project Management Institute (PMI) Talent Gap report 2021 depicts that, worldwide there is a persistent gap amongst the need for Project Management and Project Management's availability skills and talent. "Twenty-five (25) million" new project professionals are needed by the year 2030, to meet the rising demand the "2.3 million" people are needed every year. One of the main reasons is, the number of jobs that required project management-oriented skills has increased. Unless the organizations urge a culture of persistent learning, the requirement for project management talent is improbable to be met by the year 2030 [1]. In the global economy, project management is implemented in all segments. Project management is the "use of specific knowledge, skills, tools, and techniques to deliver something of value to people" [2]. Informally, Project Management has been practiced for many decades but emerged as a profession in the middle of the 20th century and

has developed dramatically as a self-contained discipline that covers a wide range of activity sectors [3]. Non-Governmental Organizations (NGOs) are generally reckoned as not-for-profit and non-state organizations that work in the interest of the public. At the community level, countrywide, and worldwide the NGOs have become stalwarts for the development since 1980 [4],[5]. The Project Management for Development (PM4DEV), a registered educational provider of Project Management Institute (PMI)'s, emphasizes that International donors have enforced different conditions, check, and balances on non-governmental organizations in recent years, that emphasize the efficacy & throughput on the planning and implementing the projects [6] Among the most common causes of project failure in NGOs in Pakistan are the lack of project management expertise, shortage of competent and skilled individuals for project implementation, procurement, monitoring, and evaluation; shortfalls of project management-trained professionals, and inadequate utilization [7].

The earlier report of Project Management Institute (PMI) "Pulse of the Profession" 2018, indicated that "poor project performance wastes 9.9% of every dollar $ invested in projects", approximately ninety-nine (99) million dollars $ for every one (1) billion $, resulting in aggregate loss is around (2) Two trillion US dollar $ per annum [8]. The Project Manager's lack of knowledge and skills of not keeping the balance of the fundamental iron triangle, the triple constraints of Project Management scope, cost, and schedule caused the failed or challenged projects. Therefore, the requirement for competent project managers is constantly increasing and companies are investing more in developing their project managers competencies [9]. More than fifty years ago, in 1969, with the establishment of the Project Management Institute, a desire for a common language in the skill development of project managers was felt [10]. Other project management-related organizations', like International Project Management Association (IPMA), also pushed for the creation of the standard terminology. The first step taken by the Project Management Institute towards addressing the aforementioned needs was publishing the first white paper, a concise report termed "Ethics, Standards, and Accreditation Committee Final Report" in 1983, the abbreviation of Project Management Professional (PMP), the assorted professional title, was initiated in 1984 [11]. Founded in 1965 and registered in Switzerland, the "International Project Management Association (IPMA)" the world's first international project management association, introduced the first version of its standard "Individual Competence Baseline" in 1998, IPMA then launched its own individual competence certification in the same year [12]. The Association for Project Management (APM) was founded in 1972 in the United Kingdom and introduced its first Competency framework in 2008 [13]. Australian Institute of Project Management (AIPM) was formed in 1976 as the forum for Project Managers and has been offering project management certifications. PROMA3 is their Project Management competence self-assessment framework [14], [15]. However, the Project Management Institute (PMI) is the global leading authority in Project Management and its Project Management standards are widely used in Pakistan due to ease and convenience of using.

The objective of this study is to identify the important project management competencies for non-Governmental organizations in Pakistan and further to prioritize the relative importance based on the subject matter expert's judgments. This research used three competency dimensions named Technical, Strategical, and Leadership and the twelve competency elements. The component of social and community development project management and NGO sector was overlooked in the preceding researchers who compared PM curricula with industry, investigated, and assessed the PMI Triangle (leading competency model and framework) with Project Management course curricula [16]. The following sections of this paper provide the relative analysis of the project management competency standards,

methodology and prioritization of the PM competencies specifically for Non-Governmental Organizations (NGOs) in Pakistan utilizing the Analytical Hierarchy Process (AHP).

II. BACKGROUND
The functional definition of competency can be characterized as a blend of skills, knowledge, traits, and behaviors that facilitates an individual to execute the tasks with a success within a given assignment. Competency is an obvious behavior, that can be quantified and assessed [17].

A. PROJECT MANAGEMENT COMPETENCY
The growing utilization of projects in achieving the organizational strategic plans and the significance accredited in securing successful project accomplishment ratios have caused the development of models and frameworks that encapsulate the necessary project management competencies [18]. There are two basic approaches in competency literature. One is the model of competency, the second is the framework of competence. Crawford introduced the first model of project management competence, amalgamating the competency model and competency framework into a unified attribute-based methodology [19].

Mihaly [20] separated the project management skills and competencies from project manager proficiency in his project management competency framework while another project competency model of El-Sabaa [21] emphasizes the field of the knowledge area of project management competency and distinguished three expertise fields, or information domains: i) human; ii) plausible and functional; and iii) technical, divided into additional 15 elements. There are various competency frameworks and models, but the standard of choosing a project management framework is defined by the large and very professional organization for project management the Project Management Institute [10], that it may be published by an internationally recognized professional association, the substance must be established on expert unanimity, it should advise specific rules, principles, and in detail narrative of project management procedures and tasks, its objective should be to assure the optimum workplace attainment in the project atmosphere. The four major industry-driven project management competency and skillset models and frameworks that satisfy the said standards are, Project Management Institute Talent Triangle [22], Individual Competence baseline Version 4.0 of [23] "Association for Project Management Competency Framework APM 2nd Edition" [13], "Australian Institute of Project Management (AIPM)" PROMA3 [15]. A leading Project Management Institute [22] developed a framework for competency and skillset development associated with Project Management Competency Development Framework (PMCDF) is called PMI Talent Triangle, which includes three types of project manager skill dimensions: technical project management skills, leadership, strategic and business management skills. PMI Talent Triangle Contains 30 skills, 10 competencies in each domain (see Table 1 for details).

TABLE 1
PMI TALENT TRIANGLE

PMI talent triangle

Dimensions	Competency elements
Technical Project Management	Schedule management, Budget and cost, Agile practices, Data gathering and modeling, earned value management, Governance (project, program portfolio), Lifecycle management (project, program, portfolio, product), Performance management (project, program portfolio), Requirements management and tractability, Risk management, Scope management (project, program, portfolio, product)
Leadership	Problem-solving, Team Building, Brainstorming, Coaching, and Mentoring Listening, Conflict Management, Emotional intelligence, Influencing, Interpersonal skills and Negotiation.
Strategic and Business Management	Benefits management and Realization, Strategic planning analysis and alignment, Customer relationship and satisfaction, Market awareness and conditions, Business acumen, Business Models and structures, Competitive analysis, Industry knowledge and standards, Legal and regulatory compliance, Operational functions (e.g., finance, marketing),

The 29 competencies of Project Manager are described in 3 dimensions of People (individuals), Practice (experience), and Perspective in Individual Competence Baseline (ICB) V 4.0, which describes competency as the application of abilities, skills, and expertise to achieve desired results are described in Table 2.

TABLE 2
INDIVIDUAL COMPETENCE BASELINE 4.0 (IPMA)

Individual competence baseline for project management version 4.0
(International Project Management Association, 2015a)

People	Self-reflection and self-management, Personal integrity and reliability, Personal Communication, Relationship and Engagement, Leadership, Teamwork, Crisis, Resourcefulness, Negotiation, Results-oriented.
Practice	Brainstorming, Project design, Requirements and Objectives, Scope, Time, Organization and information, Quality, Finance, Resource, Procurement, Plan and control, Risk and Opportunity, Stakeholders, Change and transformation Conflict
Perspective	Strategy, Governance, structure, and processes, Compliance, standard and regulation, Power and interest, Culture and values.

Project Manager's 30 competencies are classified in Technical, Behavioural, and Contextual aspects by the "Association for Project Management (APM) Competency Framework 2nd Edition" are enlisted in Table 3.

TABLE 3
ASSOCIATION FOR PROJECT MANAGEMENT COMPETENCY FRAMEWORK

The APM (Association for Project Management) Competence Framework 2ⁿᵈ Edition 2015

Technical	Budgeting and cost control, Business Case, Change Control, Procurement, Contract Management, Requirements Management, Schedule Management, Resource management, Risk, opportunity and issue, management, Quality management, Consolidated planning, Resource capacity planning, Financial Management, Frameworks, and methodologies.
Behavioral	Team management, Stakeholder and communications, Management Ethics, Compliance and professionalism, Conflict management Leadership, Capability Development.
Contextual	Governance arrangements, Asset allocation, Solutions development, Transition management, Reviews, Independent assurance, Benefits management.

The "Australian Institute of Project Management" (AIPM)'s model of competency and framework is PROMA3, the are almost similar to ICB V 4.0. Aggregate 28 competencies of Project Manager are described in 3 dimensions of people, practice, and perspective, detail in Table 4.

TABLE 4
(AIPM) AUSTRALIAN INSTITUTE OF PROJECT MANAGEMENT PROMA3

(AIPM) Australian institute of project management PROMA3

People	Self-reflection and self-management, Personal integrity and reliability, Personal communication, Relationship and engagement, Leadership, Teamwork, Conflict and crisis, Resourcefulness, Negotiation, Results-oriented.
Practice	Design, Requirements, objectives, and benefits, Scope, Time, Organization and information, Quality, Finance, Resources, Procurement and partnerships, Plan and control.
Perspective	Strategy, Governance, structure & processes, Compliance, standard & regulation, Power and interest, Culture & values.

B. PROJECT MANAGEMENT COMPETENCY DIMENSIONS IN NGOS

Selection and development of a project team is an essential task in promoting NGO project success, to be an effective NGO, the organization requires more than just a competent team. In order to meet the organization's goals, they must

have the competency to adapt to emerging trends, incorporate organizational strategic objectives into execution, develop leadership understand the technical dynamics and sound financial management knowledge [24]. According to Arif-ud-Din [7], in Pakistan, the lack of project management expertise, a deficiency of proficient and skilled individuals in project implementation, procurement, monitoring, and evaluation; shortfalls of project management-trained professionals, and inadequate utilization are one of the most common causes of project failure in NGOs. The studies on Project Management competencies in NGOs such as [25] pointed out the need for a Technical Project Management dimension that, to successfully carry out development projects, NGOs must take into consideration the technical project management competency, information of project status, stakeholder involvement, cost forecasts, resources, and communications because the donors and government agencies are increasingly evaluating the performance and accountability of nongovernmental organizations (NGOs) as they play a larger role in enhancing the well-being of the communities in which they operate. The literature has also emphasized the use of the Strategic Management dimension in NGOs as a means for improving performance and Strategic management has emerged as the "rising star of NGO sector management." to attain high performance, NGOs use strategic management [24].

Competencies relating to strategic and business management are very crucial for NGOs, such as Stakeholder management and engagement, more broadly, customer relationship and satisfaction, the studies identified that proper training and skills should be given to NGO project staff for the effective engagement of Stakeholders, its lacking impact sternly on project work [26]. Due to the strong competition to enhance the number of donors and funds generation, segmentation and advertising are two marketing actions that NGOs must undertake, so before and during their project interventions, organizations must provide insight, skills, and training to their project staff [27]. Non-governmental organizations (NGOs), besides generating funding from donors, also have to attract volunteers who are willing to contribute their time and effort to assist NGOs [28]. Other studies has also identified the Leadership dimension that, different Competencies of Project Managers is NGOs that have significant importance including Communication, Listening, Problem Solving, Team Building, Schedule and Cost Management, Stakeholder Management, Strategic Planning, etc [29]. The researcher [30], also highlighted the importance of Technical, Strategical, Conceptual, and Leaderships dimensions and different competencies elements in these. So, considering the literature and the importance of Technical, Strategic, and Leadership dimensions for NGOs Project Management competencies, the PMI Talent Triangle seems the appropriate model and framework which has essential elements.

C. TECHNICAL PROJECT MANAGEMENT
A project manager who lacks a technical understanding of the specific capabilities and knowledge required for project management in the concerned industry and field is considered incompatible. Technical Project Management focuses on the processes and tools used in project management, as well as

the fundamental knowledge required to utilize them. The importance of technical skills in the current hypercompetitive global environment is emphasized in the Report on the PMI Professional Pulse [31]. Practitioners highly value proficiencies, tools, and techniques related to Project Management, and there is a need for further research on PM knowledge, tools, and techniques [32], [33]. The PMI Talent Triangle includes ten competencies, one of which is an adaptive competency that incorporates Project Management Skills, tools, and Techniques [16]. The top three competencies in technical project management are PM Skills, tools and techniques, Schedule Management, and Cost Management. The subject matter substance of project management competencies is represented by the acquaintance, skillfulness, tools, and techniques involved [34]. Schedule Management is another crucial competency, as project managers who are knowledgeable and skilled in areas such as schedule management, cost estimation, and scope management are able to minimize the chances of project failures [35]. Cost Estimation is also an important competency, as many organizational leaders have realized that hiring competent project managers can help them complete projects on time and within budget [36].

D. STRATEGIC AND BUSINESS MANAGEMENT
The word "Strategy" is obtained from the Greek word, meaning leadership/movement and an act to accomplish the objectives of the organization [37]. Pressure has been mounting on project managers to exhibit the significance of the project to the organization strategy, especially when less than half of projects align and fit with the organization's strategy [38] and the most crucial tactic is to develop a pragmatic business case that is aligned with the organizational overall goal. The competencies cited more in the literature are Strategic planning analysis and alignment, Benefits Management & Realization, Customer Relationship and Satisfaction, and Market awareness and conditions. Strategic planning analysis and alignment entails strategic planning to attain high-level strategic performance and competitiveness. The project manager first defines the project's purposes and then determines how the defined objectives will be achieved [39]. To accomplish the project, a robust Benefit Management process is necessary for the active management of project outputs, results, benefits, and organizational strategy, as well as constant alignment between them [40]. The project benefits management is a new subject of study that emphasizes the strategic importance of projects in organizations while also describing the project benefits management approach [41], and to make certain that the project's outputs and outcomes are always in line with the project's business case benefits [42]. A recent study strengthens the relationship and depicts that a better stakeholder management approach is essential to enhance project success [43]. Further study also strengthens that project success is based on stakeholder satisfaction about the value that the project delivers [44]. Customer Relationship has been developed as a key area of interest in the domain of management and the most significant tool in the modern age to integrate customer requirements with this domain [45]. Lacking the competency of managing stakeholder satisfaction

is one of the factors contributing to the high number of failed or challenged projects [46].

E. LEADERSHIP

The existing literature highlighted the importance of the Leadership dimension, that leadership plays an important role in accomplishing goals and fostering employee success by meeting their job requirements [47]. Strong leadership is required to follow socially acceptable processes in the organization and leadership competencies are essential for the project managers as it includes decision making, problem-solving, and a new approach strategic leadership has come into the frame to combine management and leadership [48].

The project manager's leadership competency has been recognized as a vital aspect in an organization's performance in a changing environment and the most essential aspect in a company's long-term survival and success [49]. The most cited competencies in leadership literature are Team Building, Problem Solving, Verbal, and Written Communication, Coaching & Mentoring, and listening [36]. Team building involves Team Management, fostering teamwork handiness, organize and leading as per the study of The advantages of Coaching and Mentoring have a wide range from enhanced and increased productivity to employee's job satisfaction [50].Team building is one of the project manager's leadership competency components that substantially helps in successful project results. Problem Solving includes but is not limited to identifying, formulating, and solving problems, critical problem-solving skills, propose project-based solutions. The competencies of Project Managers coupled with the ability to resolve problems and all project matters play a substantial role in making the project successful [51]. The incompetence of the project manager to communicate with stakeholders has been one of the reasons for the high number of failed and challenged projects. Listening is considered a necessary skill in the organization, as good listening can enhance employees' throughput and satisfaction, listening is cognitive and vital professional competency that develops knowledge, required insight, and the ability to accomplish desired results [52].

F. RESEARCH GAP

Different shapes of competencies are required in assorted situations, however there remains a lack of research-based information on the subject. The competency worldview pointed at selecting and improving extend managers' proficiency in collaborative development ventures has been investigated by [53]. Furthermore, [54] demonstrated the significant impact of project managers' soft competencies on the long-term viability and creativity of projects. Horváth Viktória introduced vertical and horizontal dimensions of project management skills into an integrated framework, departing from the conventional one-dimensional model [55]. Furthermore, researchers [56] highlighted the substantial influence of project managers' soft skills on project success within the construction industry. They also distinguished project management competencies among International NGOs and other sectors, particularly the corporate sector [29].

While studies on Project Management Competencies exist in general, there is a notable absence of specific research focusing on the NGOs and INGO sectors at the global level, as well as in Pakistan. There is a lack of adequate study concerning the identification and prioritization of project management competency dimensions within the Non-Governmental Organization sector. This study endeavors to address these research gaps by prioritizing Project Management competencies within Non-Governmental Organizations (NGOs) in Pakistan through the utilization of the Analytical Hierarchy Process (AHP).

G. MULTI DECISION CRITERIA ANALYSIS

Decision-making is an important factor for success in any field, and multi-criteria analysis is proposed as a powerful tool to help decision-makers choose their choices better [57]. H.T. Fechner introduced the pairwise comparison in the year 1860 and Thurstone further developed it in 1927 [58]. In the MCDM framework, various methods can be used such as the Analytical Hierarchy Process (AHP), the simple multi-attribute rating technique (SMART), the SIMOS method, the stepwise assessment and ratio analysis (SWARA), the weighted sum method (WSM), and the entropy method [59]. Researchers have mostly used AHP to determine the intensity/weights of the given criteria among these methods [60], [61]. AHP is a theory of pairwise comparison calculation that relies on expert judgment to extract priority scales and is used to make multi-criteria decisions, solve complex problems [62]. The Analytical Hierarchy Process (AHP) has the foremost advantage over other MCDM methods that to obtain statistically sound & robust results substantially large sample size isn't required [63], [64]. Various researches used the sample size, ranging from four (4) to nine (9) [65], [66].

H. THEORETICAL CONTRIBUTIONS

- Provides insight into the project management competency dimensions of "Strategic and Business Management," "Leadership," and "Technical Project Management" within the NGO sector of Pakistan.
- Utilizes the opinions of subject matter experts from NGOs across Pakistan to gather diverse perspectives and expertise.
- Introduces the use of pairwise comparison and the Analytical Hierarchy Process (AHP) for data collection and analysis, contributing to the methodology used in competency framework research.

I. PRACTICAL CONTRIBUTIONS

- Offers practical guidance for NGOs in Pakistan by identifying the most significant competency dimensions for effective project management.
- Prioritizes competency areas such as Strategic Planning Alignment, Problem Solving, and Customer Relationship and Satisfaction, providing actionable insights for improving project outcomes.
- Facilitates the development of tailored training programs and capacity-building initiatives to enhance project management competencies within NGOs in Pakistan.
- Provides concrete advantages to non-governmental organizations (NGOs) in Pakistan through the

identification of the fundamental dimensions of competence that are essential for achieving success in project management.

- Places significant emphasis on critical areas of competence such as the alignment of strategic planning, effective problem-solving, and the maintenance of satisfactory customer relationships, while also presenting practical recommendations to enhance project performance.
- Enables the facilitation of targeted training modules and initiatives focused on enhancing the competencies of project management within NGOs that operate in Pakistan.

J. ANALYTICAL HIERARCHY PROCESS

The analytical hierarchy process (AHP) was introduced by Saaty (1980) as a method for multicriteria decision-making based on the pairwise comparisons [67]–[69].
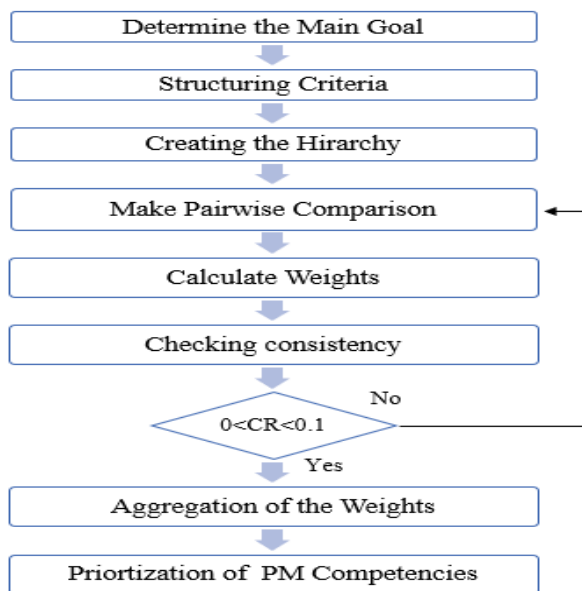

FIGURE 1: AHP flow

It gives a procedure of breaking down the general technique into a hierarchy of sub-problems that are easier to assess. AHP is used to obtain the local and global weights of the usability issues for the ranking. The AHP consists of several steps which are being followed to obtain the required results. The basic AHP flow is described in Figure 1.

Step 1: Determining goal

The first step of AHP is to determine the goal which we have to achieve i.e Prioritization of Project Management Competencies.

Step 2: Structuring the criteria and sub-criteria

After defining the goal, the next step is to define the criteria and sub-criteria. The study of the literature emphasized the significance of the three competency dimensions and the twelve preferred competencies are described in Table 5.

Step 3: Creating a hierarchy

Hierarchical structure has been designed for deciding in an order to achieve the goal. The different levels in hierarchical structure are based on goals, criteria, and sub-criteria. The completion of each hierarchy is compulsory to achieve the defined goal. The hierarchy of the research model comprises the Project Management competency elements found in the literature and described in Table 5, with adaptive competencies and modified PMI Talent Triangle. The additional and adaptive competencies are deemed to be crucial for project managers for the successful completion of projects [36], [70]–[72].The Research model is described in figure 2.

TABLE 5
A LITERATURE REVIEW ON COMPETENCIES OF PROJECT MANAGERS IN THE ORGANIZATION

Strategic and Business Management	[16], [24], [30], [38]
Strategic planning analysis and alignment	[16], [24], [39]
Market awareness and conditions	[27], [28]
Customer Relationship and Satisfaction	[25], [26], [43], [44],[45], [46]
The Benefits Management & Realization	[40], [41], [42]
Technical Project Management	[24], [25], [30]
PM Skills, tools, and techniques	[16], [34]
Schedule Management	[25], [35]
Cost Management	[25] , [36]
Leadership	[24], [47],[48], [49]
Team Building	[29], [36]
Coaching & Mentoring,	[36], [50]
Problem Solving	[36], [48], [51],
Communication	[25], [29], [36]
Listening	[29], [36], [52]

Step 4: Make a pairwise comparison matrix

The experts in this study were given specific instructions and guidelines through the questionnaire before conducting the pairwise comparisons. They were asked to compare the selected criteria and sub-criteria carefully using the assigned relative scale of pairwise comparison in the model. These results were measured by using the geometric mean approach with the Goal: Prioritization of Project Management Competencies. Criteria: Technical Project Management, Strategic & Business Management Skills, and Leadership. Sub-Criteria: 12 sub-criteria selected for comparison. The scale used in the AHP tool is from 1-9 in ranking illustrated in Table 6 below:
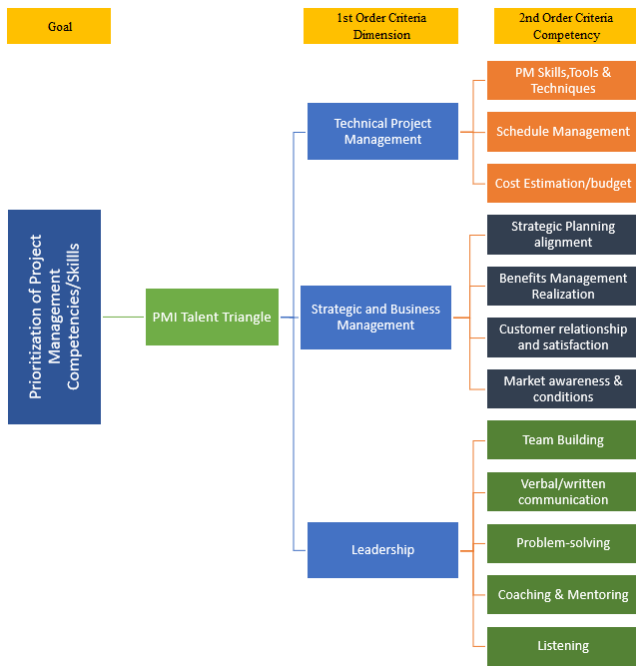
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FIGURE 2: Hierarchy of research model

$$W = [\ w_i / w_j\ ] = \begin{pmatrix} w_1/w_1 & w_1/w_2 & ... & w_1/w_n \\ w_2/w_1 & w_2/w_2 & ... & w_2/w_n \\ \vdots & \vdots & & \vdots \\ w_n/w_1 & w_n/w_2 & ... & w_n/w_n \end{pmatrix}$$

Let's denote the alternatives by {A1, A2, A3……… An}, where "n" is the number of alternatives to be compared, their current weights by {w1, w2, w3…….wn)

The pairwise comparison matrix A= [aij] denotes the intensities of expert's preference amongst individual pairs of alternatives (Ai versus Aj for all i,j=1,2,…..n). As mentioned earlier, Saaty's scale of (1/9, 1/8, 1/7……… 7,8,9) was used. Given the number of alternatives say "n" {A1, A2, A3……… An}, an expert or decision-maker evaluates and compares for all the given probable pairs, and a comparison matrix A is attained, where the component aij indicates preference weight of Aij attained by comparison Aj. The aij computes the ratios wi/wj, where w is a vector of the current weight of alternatives that is our objective goal.

TABLE 6
SAATY'S SCALE

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Moderate importance of one over	Experience and judgment favor one activity over another
5	Strong importance	Experience and judgment strongly favor one activity over another
7	Very strong importance	Activity is strongly favored over another
9	Extreme importance	The evidence of favoring one activity over another, of the highest possible
2,4,6,8	Intermediate values between the two adjacent judgments	When compromise is needed
Reciprocals	If activity i has one of the above numbers assigned to it when compared with activity j , then j has the reciprocal value when compared with i.	

Step 5: Calculating relative weights

After completing the pairwise comparison matrix step, the next step was to calculate the relative weights. A survey of the 32 subject matter experts in the NGOs sector working in Community Development in Pakistan, each having a minimum of ten (10) years of NGO project working experience was conducted. The experts were chosen from the leading and prominent Non-Governmental Organizations, certified by Pakistan Centre for Philanthropy (PCP), PCP members' directory was updated by 2020 [73]. Twenty-five (25) responses met the consistency ratio of AHP so these were considered for the detailed analysis. The minimum working experience of the Experts to respond to this study was ten years in NGOs, Forty-four percent (44%) had the working experience between 16 to 20 years, while 28%, 20%, and 8% had the working experience between 11 to 15 years, 21 to 25 years, and 26 to 30 years respectively. These weights were calculated by averaging the normalized values. The formula to calculate the relative weights is given below [74].

$$kj = \frac{\sum_{j=i}^{m} nij}{m}$$

(Where kj represents the weights of the decision matrix)

K. Dimensions

Pairwise comparison of the Criteria and dimensions that which dimension is more preferred to other, the process of computing the results of one expert is described.

Divided each number in a column of the pairwise comparison matrix by its column sum and developed a normalized matrix then computed the priority vector by averaging the row entries in the normalized matrix and computed criteria weights.

TABLE 7
PAIRWISE COMPARISON MATRIX OF THE DIMENSION OF ONE EXPERT

Pairwise Comparison Matrix of Dimension			
PMI Triangle	Technical Project Management	Strategic & Business Management	Leadership
Technical Project Management	1.00	3.00	1/7
Strategic & Business Management	1/3	1.00	1/9
Leadership	7.00	9.00	1.00
Sum	8.33	13.00	1.25

TABLE 8
NORMALIZED EIGENVECTOR AND CRITERIA WEIGHTS OF DIMENSIONS

Normalized Eigen Vector and Criteria Weights

PMI Triangle	Technical Project Management	Strategic & Business Management	Leadership	Criteria Weights
Technical Project Management	0.120	0.231	0.114	0.155
Strategic & Business Management	0.040	0.077	0.089	0.068
Leadership	0.840	0.692	0.797	0.777

Step 6: Checking consistency ratio (CR)

The calculation of consistency ratio is used to check the validity of the expert opinions. The pair-wise comparison of subject matter experts is accepted if its consistency ratio is less than CR < 10%. Otherwise, they will ask to review their preferences. E. F. Lane and W. A. Verdini (1989) emphasized that the most important step in AHP is to examine the Consistency ratio (CR) elaborating this step to check the data is consistent or not [75], [76]. Moreover, Saaty recommended that CR below 10 percent is considered acceptable; otherwise, it needs to be revised [77]. For each row of the pairwise comparison matrix, the weighted sum is determined a by summing the product of the entries and the priorities of their corresponding (column) alternatives. Thereafter, for each row divide its weighted sum by the priority of its corresponding (row) alternative. Determine the average λmax and compute the consistency index, CI of the alternatives by the following equation, CI = (λmax−n)/(n−1), Then computed the Consistency Ratio, by the ratio of CI and RI, CR=CI/RI, and RI of 3 alternatives in 0.58, described in Table 9. The RI is the random index, various authors have calculated and acquired different RIs dependent on the simulation method and the number of generated matrices involved in the process, Saaty at Wharton simulated with 500 and 100 run2) as shown in Table 9.

TABLE 9
RANDOM INDEXES

n	1	2	3	4	5	6	7	8	9
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45

The acceptable consistency ratio as per [77], [78] is < 0.1 or 10%, so the CR of .069 described in Table 10 is reasonably well within the threshold. Hence the same procedure was applied on dimension and sub-criteria for all the experts.

TABLE 10
CONSISTENCY MEASURE OF DIMENSIONS

Consistency Measure

Lambda Max	Consistency Index	Random Index for 3 alternatives	Consistency Ratio (CI/RI)
3.041	0.04	0.58	0.069
3.010			
3.189			
Avg: 3.08			

Step 7: Aggregating the weights

Thereafter preference aggregation, comparison matrices into its corresponding dimension criteria and sub-criteria weights using "AHP process", calculated the local weights using MS Excel, for each dimension criteria and sub-criteria according to inputs of subject matter experts. For an aggregation of local and global priorities, both Weighted Arithmetic Mean (WAM) and Weighted Geometric Mean (WGM) are used but studies demonstrated that in AHP, the Weighted Arithmetic Mean (WAM) doesn't indicate the preference information properly, whereas the Weighted Geometric Mean (WGM) aggregation reflects the proper preference of alternatives. For deriving global priorities of alternatives in AHP, weighted geometric mean aggregation is far better. Through WGM aggregation, under normalization of the local priorities of alternatives and weights of criteria, the ratios of global priorities of alternatives are invariant [79]. So, due to the weighted geometric mean strength of reflecting of proper preference of alternatives and weights of criteria, the WGM aggregation was used to calculate the local and global priorities of this study.

Step 8: Prioritizing project management competencies by local & global weights

The results obtained from the aggregation were used to prioritize project management competencies.

L. Local weights of dimension

The local weights and ranks of PMI Triangle dimeson i.e Criteria as described in the following Table 11

TABLE 11
LOCAL WEIGHTS AND RANK OF PMI TRIANGLE DIMENSION

PMI Triangle	Local Weights	Local Rank
Strategic & Business Management	0.39 (39%)	1
Leadership	0.35 (35%)	2
Technical Project Management	0.26 (26%)	3

λmax =3.0068
R.I for 3 alternatives= 0.58
C.I= 0.0034
Consistency Ratio CR= 0.0059 < 0.10 (Within acceptable threshold)

It depicts the local ranking of PMI Triangle dimensions, which means that Strategic & Business Management has a higher rank with 39% local weight so it has greater importance over others, while Leadership comes at second with 35% weight and Technical Project Management obtained 26% local weight so it comes at third place.

M. Local weights of 2nd order criteria, "Technical Project Management"

Table 12 demonstrate the local ranking of Technical Project Management sub-criteria, the Cost Estimation/Budget and PM Tools and Techniques are almost equal in local weights. Cost estimation had a minute advantage and ranked first with 38.58% while PM Tools and Techniques are fractionally behind by 38.57% and Schedule Management comes at third place with 22.85%.

TABLE 12

LOCAL WEIGHTS AND RANK OF TECHNICAL PROJECT MANAGEMENT

Technical Project Management	Local Weights	Local Rank
Cost Estimation/Budget	0.3858 (38.58%)	1
PM Skills Tools & Technique	0.3857 (38.57%)	2
Schedule Management	0.2285 (22.85%)	3

λmax =3.0105
R.I for 3 alternatives= 0.58
C.I= 0.0053
Consistency Ratio CR= 0.0091 < 0.10 (Within acceptable threshold)

N. Local weights of 2nd order criteria, "Strategic and Business Management"

Table 13 depicts the local ranking of Strategic & Business Management sub-criteria; experts ranked the Strategic Planning alignment higher with 35% local weight, so it has greater importance over others. Customer relationship & Satisfaction is ranked 2nd with 28% local weights. Benefits Management Realization stood at third place with 20% weight. Last but not the least, Market Awareness & Condition obtained 17% local weight, so it comes at fourth place.

TABLE 13
LOCAL WEIGHTS AND RANK OF STRATEGIC AND BUSINESS MANAGEMENT

Strategic & Business Management	Local Weights	Local Rank
Strategic Planning Alignment	0.35 (35%)	1
Customer relationship & Satisfaction	0.28 (28%)	2
Benefits Management Realization	0.20 (20%)	3
Market Awareness & Condition	0.17 (17%)	4

λmax =4.0166
R.I for 4 alternatives= 0.90
C.I= 0.0055
Consistency Ratio CR= 0.0061 < 0.10 (Within acceptable threshold)

O. Local weights of 2nd order criteria, "Leadership"

The local ranking and weights of Leadership sub-criteria; the subject matter experts ranked the Problem Solving on the top amongst all alternatives with 31% local weight, so it has greater importance over others. Team Building is ranked 2nd with 27% local weights. Coaching & Mentoring stood at third place with 17% weight. Verbal and Written Communication has been ranked at fourth place with 13% weight. Listening comes at 5th rank with 12% local weight. Table 14 illustrates the results.

This step includes a calculation of local and global weights. Local weights are an important substitute concerning a specific criterion while Global weights are the result that is measured from the priority criteria and the local priority. The criteria with the highest overall priority are the best choice. The calculated global and local weights of this study are calculated in the result section.

TABLE 14
LOCAL WEIGHTS AND RANK OF LEADERSHIP

Leadership	Local Weights	Local Rank
Problem Solving	0.31 (31%)	1
Team Building	0.27 (27%)	2
Coaching & Mentoring	0.17 (17%)	3
Verbal and Written Communication	0.13 (13%)	4
Listening	0.12 (12%)	5

λmax = 5.0598
R.I for 5 alternatives= 1.12
C.I= 0.0150
Consistency Ratio CR= 0.0134 < 0.10 (Within acceptable threshold)

This step includes a calculation of local and global weights. Local weights are an important substitute concerning a specific criterion while Global weights are the result that is measured from the priority criteria and the local priority. The criteria with the highest overall priority are the best choice. The calculated global and local weights of this study are calculated in the Result/Discussion section.

P. Global weights

The normalized weights obtained were the local weights of criteria. To obtain the Global Weight of the sub-criteria, the local weights of each sub-criteria were multiplied with the local weight of the respective criteria weights. For instance, the global weight of Schedule Management (.5918) is obtained by multiplying its local weight (.2285) with its dimension Technical Project Management local weight of (.26). So all the global weights of individual criteria resulting from the involvement of all sub-criteria are obtained by multiplying their normalized weight. Global ranking using AHP is illustrated in Table 15.

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TABLE 15
GLOBAL RANKING OF DIMENSION AND SUB-CRITERIA

Main Criteria	Priority Weights with %	Local Ranks of Criteria	Sub-criteria	Local Weights with %	Local Ranks	Global weights with %	Global Ranks
Technical Project Management	0.26 (26%)	3	Project Management Skills, Tools & Technique	0.3857 (38.57%)	2	9.989%	5
			Schedule Management	0.2285 (22.85%)	3	5.918%	10
			Cost Estimation/Budget	0.3858 (38.58%)	1	9.992%	4
Strategic & Business Management	0.39 (39%)	1	Strategic Planning analysis and Alignment	0.3469 (34.69%)	1	13.531%	1
			Benefits Management Realization	0.2044 (20.44%)	3	7.975%	7
			Customer relationship & Satisfaction	0.2758 (27.58%)	2	10.759%	3
			Market Awareness & Condition	0.1729 (17.29%)	4	6.744%	8
Leadership	0.35 (35%)	2	Team Building	0.2741 (27.41%)	2	9.618%	6
			Verbal & Written Communication	0.1318 (13.18%)	4	4.627%	11
			Problem Solving	0.3090 (30,90%)	1	10.844%	2
			Coaching & Mentoring	0.1692 (16.92%)	3	5.939%	9
			Listening	0.1158 (11.58%)	5	4.064%	12

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Q. Competency ranking with global weights:

As shown in Table 15, the ranking of the 12 Project Management Competencies is revealed according to the following order: Strategic Planning Alignment (.135), Problem Solving (.108), Customer Relationship and Satisfaction (.107), Cost Estimation/Budget (.9992), Project Management Tools and Techniques (.9989), Team Building (.962), Benefits Management Realization (.797), Market Awareness and Condition (.674), Coaching and Mentoring (.593), Schedule Management (.5918), Written and Verbal Communication (.462) and Listening (.406).

TABLE 16
GLOBAL RANKING AS PER WEIGHTS

Competencies	Global weights with %	Global Ranks
Strategic Planning Analysis & Alignment	13.53%	1
Problem Solving	10.84%	2
Customer relationship & Satisfaction	10.76%	3
Cost Estimation/Budget	9.99%	4
Project Management Skills, Tools & Technique	9.99%	5
Team Building	9.62%	6
Benefits Management Realization	7.98%	7
Market Awareness & Condition	6.74%	8
Coaching & Mentoring	5.94%	9
Schedule Management	5.92%	10
Verbal & Written Communication	4.63%	11
Listening	4.06%	12
	100.00%	

III. DISCUSSION ON RESEARCH FINDINGS

This study outlined the findings aimed at identifying the important project management competencies for the Non-Governmental Organization of Pakistan and further performed multi-criteria decision analysis (MCDA) using the Analytical Hierarchy Process (AHP) to rank the Project Management Competencies based on their relative weight. The results of the research are explicit, identifying dimensions and Project Management competencies that are more important for the NGOs in Pakistan. This analysis reveals key distinctions between these competencies and those previously identified in the literature. The standout from the perception and point of view of the Project Managers is the importance of Strategic and Business Management that aligned the project with the organizational strategic and business development plan. The results of this study are quite different from the previous academic curricula research of [16], in this study of NGOs PM Competencies, for Technical Project Management dimension, Cost Estimation/Budget is more dominant whereas, in the preceding study of academic curricula and Industry, the Project Management Skills, Tools and Technique competency had more dominance. In the Strategic and Business Management dimension, the competency of Strategic analysis and alignment is dominant in both studies, however, in the earlier study, the Benefits

Management realization has the second-highest ranking while in this study the Customer relationship and Satisfaction weighted higher as stakeholder engagement competency found more importance in NGOs. In the Leadership dimension, Problem Solving has more relative weightage while in the preceding study, Team building had more supremacy. The identified competencies of the study of [29] are more related to the human aspect and emphasized adaptability, networking, and local knowledge, capacity building, ethics but the current study identified competencies that are more tilted to Strategic alignment and analysis.

The finding of the study illustrates that the most important and preferred dimension of Project Management competence to Non-Governmental Organizations in Pakistan is "Strategic and Business Management" with a 39% weightage of importance. The endurance in the current environment is possible only based on the timely strategic planning of project activities and the competitive strategy forms a competitive advantage and facilitates success [80]. The subsequent dimension is "Leadership" with a 35% weightage of importance. Earlier studies have proved the significant relationship between leadership competencies and project success. Enhanced capability of the Leadership dimension facilitates higher success in project management [81]. The "Technical Project Management" with 26% weightage of importance comes at third. The PMI Pulse of the Profession Report [31] emphasized the need for technical skills in the current hypercompetitive global environment.

As per the Global ranking and weights, the "Strategic Planning analysis and alignment" has the most significance. Strategic alignment positively influences and has a great impact on decision efficacy [82] and symbolizes the degree of alignment amongst project and organizational strategy and all-inclusive approaches to assess project success [83]. The "Problem Solving" competency ranked as the second most significant competency. The competencies of Project Managers coupled with the ability to resolve problems and all project matters play a substantial role in making the project successful [51]. The "Customer Relationship and Satisfaction" competency ranked third at the global weight. A recent study by [44] strengthens that project success is based on stakeholder satisfaction about the value that the project delivers. Customer Relationship has been developed as a key area of interest in the domain of management and the most significant tool in the modern age to integrate customer requirements with this domain [45] .

The fourth-ranked competency at global weights is "Cost Estimation/Budget". Cost is one of the most important pillars of the Triple Constraint in Project Management and the competency to estimate the project cost accurately, financial analysis and to spend efficiently is critical for project success. "Project Management Skills, Tools and Technique" competency is ranked at fifth place. The Project practitioners are consistently emphasizing adaptive Project Management skills, tools, and techniques [33]. "Team Building" competency ranked at sixth place, As per the study of [36], Team building is one of the project manager's leadership competency components that substantially helps in successful project results. The seventh rank is "Benefits Management Realization". The "Benefits Management Realization"

component enables project managers proficiency to appraise the benefits of a project to the organization, evaluate feasibility and project success, leading decrease project failure [84]. The eighth-ranked competency is "Market Awareness and Condition", it facilitates the project manager to obtain a better knowledge of the current environment and market condition and the positioning of the respective organization in the industry. "Coaching and Mentoring" are ranked ninth at the table, the project manager's competency of coaching and mentoring can improve the performance and efficiency of the organizations. The advantages of Coaching and Mentoring have a wide range from enhanced and increased productivity to employee's job satisfaction [50]. The "Schedule Management" is at tenth rank and another most important pillar of the Triple Constraint in Project

FIGURE 3: Ranking of project management competencies with global weights
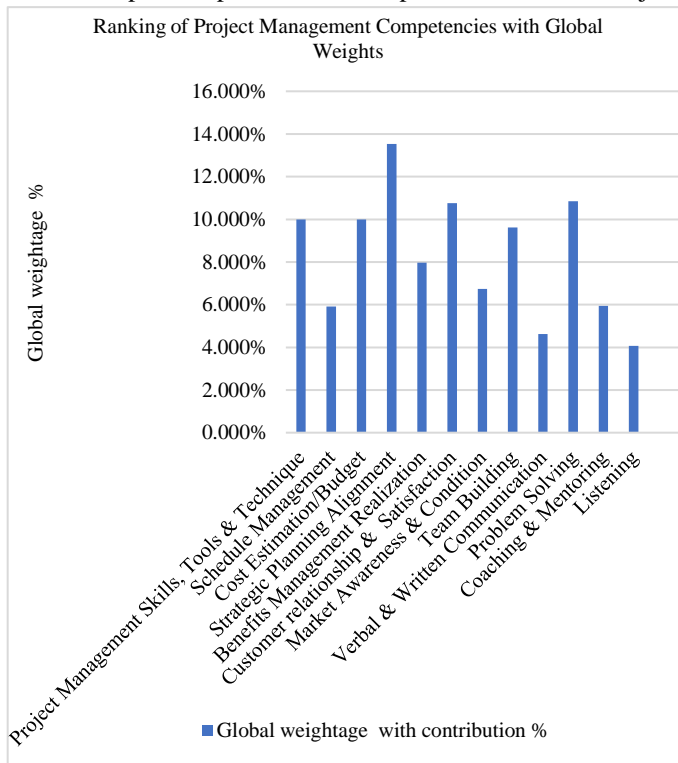
Management. Project success is also measured by its completion on the planned schedule as changes in schedule impacts the whole project so the competency to manage the project effectively is very important. Verbal and Written Communication comes at eleventh place. The incompetence of the project manager to communicate with stakeholders has been one of the reasons for the high number of failed and challenged projects [36]. "Listening" is ranked at the twelfth 12th as per the global weights. Listening is cognitive and vital professional competency, it develops knowledge, required insight, and the ability to accomplish desired results [52].

IV. CONCLUSION
A well-structured and well-defined competency framework plays a key role in accomplishing the non-governmental organization's goals in line with its mission and strategic plan.

- The result of this study concluded that as per the subject matter experts of NGOs in Pakistan, in the competency dimension the "Strategic and Business Management" has the most importance, followed by "Leadership and "Technical Project Management". Though each dimension and competency have its importance, they need to be prioritized in the order of importance. The conclusion of the study is,
- It provides the obvious insight into the behaviors, competencies to be exhibited and the required skills to achieve organizational goals and project objectives.
- It provides NGOs in Pakistan the way forward to avoid project challenges and failures in a future project of NGOs, what competencies are required, and if those competencies and skills are considered then organizations can achieve the project objectives.
- Taking into consideration the Pareto Principle, also known as the 80/20 Rule, the law of the vital few, and the principle of factor sparsity, if NGOs may work on the top few identified competencies, such as Strategic Planning Alignment, Problem Solving, Customer Relationship and Satisfaction, Cost Estimation/Budget, Project Management Tools and Technique then they can resolve most of the problems of the project failures and challenges.
- The study also indicates to the Project Managers what skills, behaviors, and aptitude are valued, recognized, and rewarded, so they may develop these competencies for their future growth.
- Moreover, this study will also be helpful to strengthen the existing project management practices and will facilitate NGOs for performance management, staff development, planning, and future recruitment for the effective charge of the objectives.

FIGURE 4: Competency ranking with global weights

V. LIMITATION AND FUTURE RESEARCH SUGGESTION
This study was performed on the PMI Triangle Competence framework using Analytical Hierarchal Process (AHP). Data

collection wasn't easy because of the complex nature of the AHP Technique and the experts were asked to reconsider their judgment to maintain the consistency ratio below the threshold of < 0.10. Whereas, in the future, other Project Management Competency frameworks can be opted and prioritize. The Project Management Competency framework can be compared with each other as well. Other Multi Decision Criteria Methods (MDCM) like Fuzzy AHP, TOPSIS, Fuzzy TOPSIS can be used for prioritization. This study was performed on the NGOs working in Community Development in Pakistan, future studies can be made on the NGOs working in other thematic areas and at the provincial and regional level as well.

VI. MANAGERIAL INSIGHTS AND PRACTICAL IMPLICATIONS MANAGERIAL INSIGHTS:

- Recognizes the critical role of strategic and business management competencies in driving the success of NGO projects in Pakistan, highlighting the importance of aligning project objectives with organizational goals.
- Emphasizes the significance of leadership competencies in fostering team effectiveness and navigating complex project environments, underscoring the need for strong leadership capabilities among project managers.
- Highlights the importance of technical project management competencies in ensuring the successful execution of project tasks and deliverables, emphasizing the need for project managers to possess a diverse skill set.

PRACTICAL IMPLICATIONS:

- Provides actionable insights for NGO managers and leaders to prioritize competency development efforts, focusing on areas such as strategic planning, problem-solving, and customer relationship management.
- Suggests the implementation of targeted training programs and mentoring initiatives to enhance project management competencies among staff members, fostering a culture of continuous learning and improvement.
- Recommends the integration of project management tools and techniques to streamline project processes and improve overall project efficiency, enabling NGOs to achieve greater impact with limited resources.

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