

Selecting a priority strategy to enhance the ambidextrous leadership competence of project managers in the telecommunication industries

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ABSTRACT

The author's previous research has found a strong link between project managers adopting an ambidextrous leadership style and improved project performance in the telecommunications industry. This leadership approach, blending Transactional and Transformational elements, has proven to be impactful. Therefore, it is essential to devise methods for enhancing project managers' adeptness in ambidextrous leadership. This study aims to create a prioritized strategy program to enhance project managers' ambidextrous leadership skills in Indonesia's telecommunications sector. The Fuzzy Analytical Hierarchy Process (Fuzzy AHP) involved 15 experts as respondents, ensuring a comprehensive perspective from academics, consultants, and practitioners. The study's findings underscore the importance of Ambidextrous Leadership skills, followed by managing stakeholder relationships. The key factor is the Project Manager's role, supported by backing from the company or institution. The primary goal is to enhance Project Performance and improve adaptability to change. The recommended strategy prioritizes a Leadership Development Program followed by a Change Management Development Program. This study emphasizes the practical approach to developing project managers' ambidextrous leadership skills to enhance project performance in Indonesia's telecommunications sector. The focus is on the Leadership Development Program, offering actionable insights for industry professionals.

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1. Introduction

Project assignments are a typical component of any organization. Project Management Institute (2021) defines "a project as a temporary endeavor undertaken to create a unique product, service, or result." The effectiveness of project execution largely hinges on the project manager's leadership abilities. These individuals, as the key drivers of project success, play a pivotal role in ensuring the success of organizational projects. Effective project management is essential for organizational success, and enhancing leadership skills is vital for achieving successful project outcomes (Turner & Muller 2005; Mazzetto, 2019). The telecommunications sector is well-known for its significant environmental volatility, characterized by rapid and inconsistent technological advancements, shifting market demands, heightened competition, and changing regulatory frameworks. The telecommunications industry in Indonesia is characterized by significant turbulence, with studies indicating that it currently operates within a highly competitive "Red Ocean" environment (Budisusetio, 2019; Nashiruddin 2019). The telecommunications sector's complex and ever-evolving landscape necessitates a unique set of skills and expertise for successful project management (Zheng et al., 2017). As telecommunication projects become more intricate and interconnected, strong project management practices are crucial to guaranteeing successful results (Shaukat et al., 2022). Engineering, technology, and construction managers require effective leadership as a core behavior, resource, and attribute (Farler & Haan 2021). A Project Management Institute (2020) survey of 3,972 professional project managers found that 65% of the respondents emphasized the importance of leadership skills, ranking them as a close second to other essential skill requirements. Leadership style encompasses leaders' characteristics, skills, and behaviors when interacting with team members

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(Northouse, 2023). The two most prominent leadership styles identified in organizations are transformational and transactional leadership (Bass & Avolio, 1996). Ambidextrous leadership fosters the enhancement of both exploratory and exploitative actions in team members (Mueller et al., 2020; Freeman et al., 2020). Ambidexterity refers to the capacity to effectively utilize two opposing abilities simultaneously.

Ambidextrous leadership, defined as balancing exploitative and explorative behaviors, is increasingly acknowledged as crucial for project managers aiming to drive organizational success in today's rapidly evolving business environment (Zheng et al., 2017; O'Reilly & Tushman, 2021). When employed individually, transactional and transformational leadership styles do not directly affect Project Performance in the Telecommunication Industry. Nonetheless, Ambidextrous Leadership notably enhances Project Performance, underscoring its pivotal role in project success (Misbahuddin et al., 2024). Therefore, to improve the project manager's competence in Ambidextrous Leadership, it is crucial to develop an alternative strategic program and prioritize its execution. This is the main objective of this paper.

2. Materials and Methods

2.1. Material and Methods

The study utilized the fuzzy analytical hierarchy process (FAHP), an improved version of the traditional AHP. This process incorporates a fuzzy scale for pairwise comparisons (Kumar & Singh, 2012; Chen et al., 2021). The Analytic Hierarchy Process (AHP), developed by Saaty, is a decision-making framework grounded in three fundamental principles: hierarchical structuring, prioritization, and logical consistency (Saaty, 1987; Vaidya & Kumar, 2021). The primary data was collected through in-depth interviews and questionnaires with fifteen (15) experts from three different perspectives. The first group consisted of Academicians (4 experts) from four different Universities who held doctoral degrees, were senior lecturers in project management, and had experience as project managers. The second group comprised Consultants/Trainers (5 experts) who were certified in international project management or held a doctoral degree and were chairpersons of project management associations or project management consulting firms. The third group included practitioners (6 experts) from six telecommunication companies. All the practitioner experts are certified in international project management and hold senior positions as project directors or heads, with over 15 years of project experience. The fifteen (15) Experts represent the best composition of Project Management's voice in Indonesia's Telecommunication Industry recently. The process of designing a hierarchy concept, conducting in-depth interviews, processing data in Fuzzy AHP, and reporting was conducted from June 2024 to September 2024.

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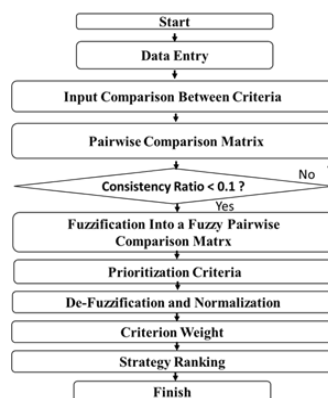


Fig. 1. The steps of using Fuzzy AHP source, Marimin et al. (2013)

Research with Fuzzy AHP begins by defining the problem, setting goals, criteria, and alternatives, and then compiling a decision hierarchy. Data is collected through surveys or interviews with experts to conduct paired comparisons, which are then converted to a fuzzy scale. Next, the matrix is normalized to calculate the priority weight of the fuzzy, followed by a defuzzification process to convert the weight into a crisp value. Alternatives are then sorted by priority, and the results are validated to ensure consistency and relevance. Expert questionnaire data is input into onlineoutput.com software which will produce pairwise comparisons and determine priority vectors for each element.

2.2. Hierarchy Design

A decision problem's conceptual model must be developed before data gathering. When building hierarchies, it is essential to incorporate sufficient relevant details to adequately capture the issue's complexity while avoiding overwhelming amounts of information that could complicate decision-making (Saaty, 1987). Developing a hierarchical model involves conducting a comprehensive literature review and engaging in in-depth discussions with subject matter experts. This model comprises five distinct levels. Firstly, it entails identifying and defining the FOCUS issue the model seeks to address. Next, it examines the various FACTORS or criteria influencing the identified problem. Subsequently, it delves into determining the critical ACTOR or stakeholders involved in the processes related to the problem at the third level. Finally, it concerns the exploration of ALTERNATIVE STRATEGIES, which serve as the primary objective of the research effort at the fifth and final levels. Fig. 2 shows the five levels of the Hierarchy Model,

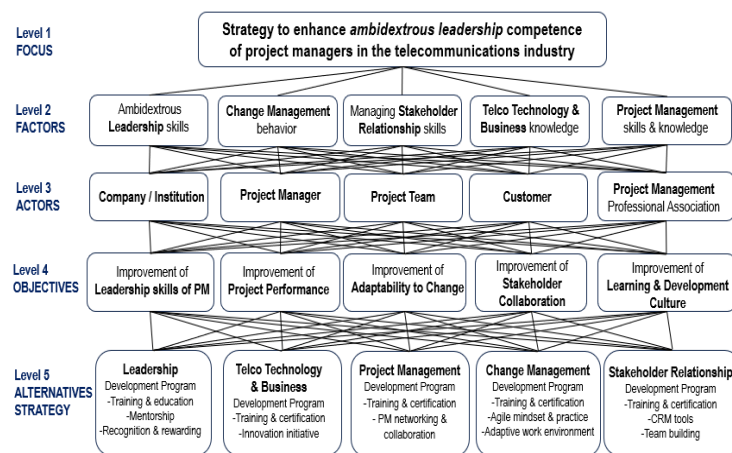


Fig. 2. Analytical Hierarchy Model
Source: modified by authors

The description of five level model, as follows:

- Level 1 Focus.

Previous research; summarizes the importance of ambidextrous leadership competence of project managers in the telecommunication industry (Misbahuddin et al., 2024). Based on this, we define the problem and determine the focus as the first level of the hierarchy.

- Level 2 Factor.

We defined five factors: (a) leadership skills, (b) change management behavior, (c) managing stakeholder relationship skills, (d) Telco technology and business knowledge, and (e) project management skills and knowledge. Leadership encompasses knowledge, skills, and behaviors (Project Management Institute, 2017; Northouse, 2023). In today's dynamic business environment, project managers must develop ambidextrous leadership skills to guide organizations toward success effectively (Zheng et al., 2017). Effective management addresses complexity, whereas strong leadership fosters meaningful change (Kotter, 1999; Yukl, 2020). According to Kotter, leadership is essential in driving change, as it involves setting a clear vision, aligning people, and motivating them to action (Mekonnen & Bayissa, 2023). Research from Errida and Lotfi (2021) on the importance of leadership and change management. Effective stakeholder management is key to achieving project goals and stakeholder satisfaction (Rajablu et al., 2015; Nwangwu 2019). By integrating their technical expertise with ambidextrous leadership capabilities, they can navigate the complexities of digital transformation and enable their teams to thrive in a constantly evolving industry (Zaman et al., 2022). According to the Project Management Body of Knowledge the project management framework addresses a range of leadership competencies (Project Management Institute 2021; Faisal et al., 2023).

- Level 3 Actor

There are five actors namely (a) Organization, (b) Project Manager, (c) Project Team (d) Customer (e) Project Management Professional Association. The Actors in Project Management are called Stakeholders, which means they can be individuals, groups, or organizations that may affect, be affected by, or perceive themselves to be affected by a decision, activity, or outcome of a portfolio, program, or project (Project Management Institute, 2021). Research in the Telkom FTTH project includes internal and external stakeholders, including internal company leaders, project managers and project teams (Prawansa et al., 2019). The project team is one of the stakeholders of the project (Jaya et al., 2023). Project Management Association such as PMI and IPMA is a stakeholder which provide a framework that develops the project manager's leadership competence (Faisal et al., 2023).

- Level 4 Objective

The Objectives can be categorized into (a) improving Leadership skills (people-based), (b) improving Project Performance (results-based), (c) improving Adaptability to Change (people and process based), (d) improving stakeholder collaboration (people and process), and (e) improving learning and development culture (people and process based). One of the goals of enhancing ambidextrous leadership skills in project managers is to improve their overall leadership competencies. Ambidextrous leadership is needed in organizational resilience (Gill et al., 2019). Project-based companies require mapping of project managers' leadership competency profiles as a benchmark in selecting project managers (Umam, 2015). One critical factor in Project performance is the capability and leadership of the project manager (Gumay et al., 2020). Project manager leadership competency has a significant linear relationship to project performance (Hidayati, 2016). Increasing the leadership competence of project managers includes increasing abilities in change management (Tanjaya, 2016). The influence of stakeholder satisfaction is very important in the success of project management (Rajablu et al., 2015). Extent research suggests that ambidextrous leadership can enhance an organization's ability to adapt to changing environments (Gill et al., 2019). One of the objectives of enhancing ambidextrous leadership competencies in telecom project managers is to improve their collaboration with stakeholders. Ahsan (2024) emphasizes that learning and development initiatives are steered by effective leadership. One critical leadership skill is identifying and nurturing individual, social, and structural enablers supporting a culture of continuous learning (Quatman-Yates et al., 2019). Sustainable leadership significantly affects organizational learning and substantially impacts sustainable performance (Iqbal & Ahmad, 2021).

- Level 5 Alternative Strategy

The Strategies consist of five alternatives: (a) Leadership Development Strategy, (b) Telco Technology and Business Development Program, (c) Project Management Development Program, (d) Change Management Development Program, and (e) Stakeholder Relationship development program. The purpose of leadership development and to reduce the gap in their current leadership skills (Tang, 2019). To effectively navigate the complexities of digital transformation in the telecommunications industry, project managers can combine their technical expertise with adaptable leadership skills to support their teams in achieving success within this dynamic field (Zaman et al., 2022). Studies show that as professionals in project management, project management development programs with PMI certification are the most valuable for senior project managers on construction projects (Barrows et al. 2020). Project management development programs are very important (Aslam & Bilal, 2021). Change management and leadership development have a strong connection (Errida & Lotfi, 2021). The development of project management and change management has the potential to contribute together in realizing organizational change (Pollack & Algeo, 2016). Project managers should be equipped with the ability to handle change management with adaptive agile practices (Annosi et al., 2020; Raharjo & Purwandari, 2020). Leadership and management skills of stakeholders acting together influence the implementation of telecommunications projects (Akhwaba et al., 2020). Project Management Institute (2021) outlines the role of effective leadership and stakeholder management in project success.

3. Results and Discussions

The results of the Fuzzy AHP questionnaire are illustrated in Fig. 3, showing the weights of each alternative, with the first priority highlighted in blue. The fuzzy AHP analysis shows the Factor, Actor, Objective, and Alternative Strategies in Tables 1, 2, 3, and 4, respectively.

Table 1

Factor weight on the strategy to enhance the ambidextrous leadership competence of project managers in the telecommunication industries

No	Factor	Priority	Priority
1	<i>Ambidextrous Leadership</i> skills	0.2042	1
2	<i>Managing Stakeholder Relationship</i> skills	0.2021	2
3	<i>Project Management</i> skills and knowledge	0.2011	3
4	<i>Change Management</i> behavior	0.1978	4
5	<i>Telco Technology and Business</i> knowledge	0.1948	5

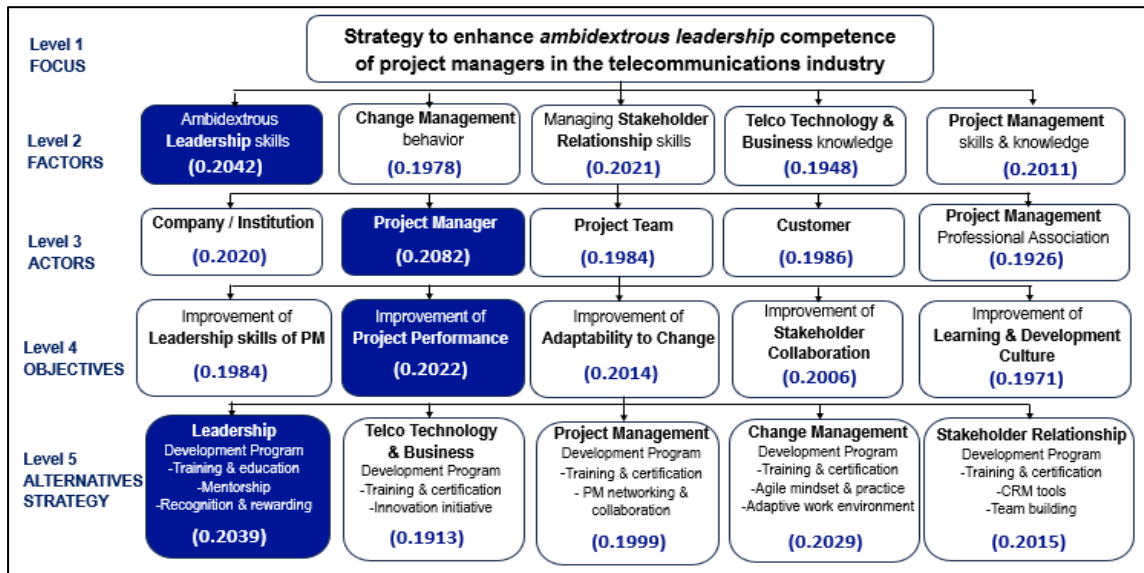


Fig. 3. Hierarchy of Strategy to enhance the ambidextrous leadership competence of project Manager in the Telco Industry

At the Factor level as in Table 1, ambidextrous leadership is the highest priority (0.2042), which highlights the need for project managers to balance operational efficiency with innovation, which is especially important in fast-growing telecommunications companies (Zheng et al., 2017). This is followed by managing stakeholder relationships (0.2021), which is important for aligning project outcomes according to stakeholder expectations, thereby increasing project success (Rajablu et al 2015; Nwangwu 2019). Project management skills and knowledge (0.2011) in third place with a focus on effective project planning and implementation. The development of leadership competencies is very important within the project management framework (Project Management Institute 2021; Faisal et al., 2023). As emphasized by Kotter (1999), change management skills and behaviors (0.1978) are essential for leading and adapting to organizational change (Yukl 2020). A Project Manager requires the ability to adapt to change and a high level of flexibility so that he is able to resolve challenges that could hinder the achievement of the five project success criteria. It will be a project risk if the Project Manager does not have cognitive flexibility in his leadership.. Technology and telecommunications business knowledge (0.1948) is needed to understand the specifics of the industry which continues to develop (Zaman et al., 2022). Overall, the emphasis is on a balance between leadership, stakeholders, and change management, with technical expertise being important but secondary. This is necessary for the ability to adapt and innovate in the telecommunications sector.

Table 2

Actors weight on the strategy to enhance the ambidextrous leadership competence of project managers in the telecommunication industries

No	Actor	Priority	Priority
1	Project Manager	0.2082	1
2	Company/Institution	0.2020	2
3	Customer	0.1986	3
4	Project Team	0.1984	4
5	Project Management Professional Association	0.1926	5

At the Actor level as in Table 2, Project managers (0.2082) are the top priority, reflecting their important role in project success through leadership and decision making. Followed by company/organization (0.2020), which provides resources and strategic direction. Customers (0.1986) prioritized ensuring their needs were met, emphasizing their importance in achieving project success. The Project Team (0.1984) is very important in implementation, while the Association of Project Management Professionals (0.1926), although influential, has the lowest priority. Project management associations serve as supporting entities that provide project management leadership development frameworks and standards (Faisal et al. 2023). This priority setting is in line with the definition of stakeholders proposed by Project Management Institute (2021), which highlights the importance of internal (project managers, organizations, teams) and external (customers) stakeholders. At the objective level as in Table 3. Improving project performance (0.2022) is the main priority, emphasizing the need for effective project implementation and achieving desired results, as outlined by Project Management Institute (2017) in terms of quality, timeliness, customer satisfaction, and budget compliance. This is in line with Gumay et al. (2020), which emphasizes the importance of project managers' abilities in driving performance. This is followed by the ability to adapt to change (0.2014), which is very important in today's dynamic environment. The ability to adapt to new conditions and balance current operations with new opportunities reflects the importance of ambidextrous leadership in fostering organizational resilience (Gill et al., 2019).

Table 3

Objectives weigh on the strategy to enhance the ambidextrous leadership competence of project managers in the telecommunication industries

No	Objective	Priority	Priority
1	Improvement of <i>Project Performance</i>	0.2022	1
2	Improvement of <i>Adaptability to Change</i>	0.2014	2
3	Improvement of <i>Stakeholder Collaboration</i>	0.2006	3
4	Improvement of <i>Leadership skills of PM</i>	0.1984	4
5	Improvement of <i>Learning & Development Culture</i>	0.1971	5

Project manager leadership competence has a significant linear relationship to project performance (Hidayati 2016). Likewise, increasing the leadership competence of project managers includes increasing abilities in change management (Tanjaya 2016). Furthermore, stakeholder collaboration (0.2006) highlights the importance of involving and managing relationships with all stakeholders to ensure project success. The influence of stakeholder satisfaction is very important in the success of project management (Rajablu et al., 2015). PM leadership skills (0.1984) critical for effective project management, with leadership driving project performance and fostering a supportive culture for continuous improvement (Ahsan, 2024; Quatman-Yates et al., 2019). Lastly, Learning and development culture (0.1971) supports long-term success by encouraging sustainable growth and adaptability in the organization, which is significantly influenced by leadership (Iqbal & Ahmad, 2021). A focus on project performance, adaptability, and stakeholder collaboration underscores a comprehensive approach to improving project management practices, integrating technical skills, leadership, and organizational culture to achieve sustainable success.

Table 4

Alternative strategy to enhance the ambidextrous leadership competence of project managers in the telecommunication industries

No	Alternative Strategy	Priority	Priority
1	<i>Leadership Development Program</i>	0.2039	1
2	<i>Change Management Development Program</i>	0.2029	2
3	<i>Stakeholder Relationship Development Program</i>	0.2015	3
4	<i>Project Management Development Program</i>	0.1999	4
5	<i>Telco Technology & Business Development Program</i>	0.1913	5

In the alternative strategies section, as shown in Table 4, the detailed elaborations are as follows:

(a) Leadership Development Program (0.2039)

This is the highest strategy priority, indicating a strong focus on enhancing leadership capabilities through training, mentorship, and rewards. It is important to develop ambidextrous leadership skills that help managers balance innovation with operational efficiency (Zheng et al. 2017). The aim is to reduce the gap in the leadership competencies of current project managers (Tang 2019). The leadership development program includes activities:

- **Training and Education:** A leadership training initiative should enhance ambidextrous leadership by integrating exploitation (refining processes) and exploration (pursuing opportunities). This program combines theoretical knowledge, practical skills, and ongoing support to develop leaders capable of balancing current operations with innovation.
- **Mentorship;** Mentorship plays a crucial role in the development of ambidextrous leadership skills. It offers personalized guidance and feedback to help leaders balance exploiting existing processes with exploring new opportunities. Mentorship is widely acknowledged as a critical process for achieving personal and professional success (Manuel & Poor-sattar, 2021). Leadership development programs include mentoring and coaching activities (Tang 2019)
- **Recognition and Rewarding:** As a part of leadership development program, a recognition and reward system is crucial for motivating and sustaining ambidextrous leadership. It should promote both exploitation and exploration by offering tangible rewards (e.g., bonuses and promotions) and intangible rewards (e.g., public recognition and professional development opportunities)

(b) Change Management Development Program (0.2029)

The second priority strategy emphasizes equipping project managers with skills to manage change through agile practices and adaptive environments, which are essential for the dynamic telecom sector (Annosi et al., 2020; Raharjo & Purwandari, 2020). Agility is vital for effective project management as change is constant (Prange, 2021). Leaders act as change agents, guiding organizations through the change process. Change management and leadership development are closely related (Errida & Lotfi, 2021).

- **Training and Certification:** Comprehensive Change Management training should address innovative and routine challenges, including training on change models like ADKAR and techniques for resistance management. Agile Change Management principles should be included, and the recommended certification is PMI-Agile Certified Practitioner
- **Agile mindset and practice:** Telecom project managers should embrace an Agile mindset that values collaboration and responsiveness to change (Fowler & Highsmith, 2001). Familiarity with frameworks such as Scrum and Kanban enhances their ability to handle challenges.
- **Adaptive workspace environment:** An adaptive workspace, which promotes flexibility and evolution of workspaces, fosters agility and adaptability within project teams. Agile methodologies emphasize collaboration, communication, and efficiency through face-to-face interactions and co-location. Prioritizing direct conversations over written documentation facilitates effective information exchange, as in the Agile Manifesto (Cockburn, 2007). Co-location enhances team communication, and osmotic communication allows team members to absorb information passively. By integrating an adaptive mindset, Agile practices, and adaptable workspaces, companies can help project managers cultivate ambidextrous leadership skills.

(c) Stakeholder Relationship Development Program (0.2015)

The third strategic priority emphasizes the need for training in stakeholder management, customer relationship management (CRM) tools, and team building to increase project success and stakeholder engagement (Rowlinson & Cheung 2008). The Project Management Institute (2021) emphasizes the importance of developing stakeholder management skills for project managers.

- **Training and certification:** The training should cover stakeholder management fundamentals, including identifying and analyzing stakeholders, developing engagement strategies, and using advanced conflict resolution and negotiation techniques. Relevant certifications include Project Management Professional (PMP) and Certified Negotiation Expert (CNE)
- **Customer Relationship Management (CRM) tools:** Practical CRM tools are essential for managing customer interactions and data, enhancing relationships and customer satisfaction while supporting project success. These tools facilitate creative engagement with stakeholders and routine tasks, such as communication tracking, tailored to fit telecom project management practices.
- **Team building:** Effective team building is crucial for project success, fostering stakeholder alignment and collaboration. Regular activities, such as workshops and retreats, including outbound activities, strengthen relationships, enhance adaptive skills, and promote creativity and effective execution through improved communication and trust.

(d) The Project Management Development Program (0.1999)

In priority in fourth place. This program focuses on improving project management skills through training, certification, and networking, which is critical to managing complex projects effectively (Barrows et al. 2020). Aslam and Bilal (2021) emphasize the importance of project management development programs.

- **Training and certification:** Training and certification in Project Management are crucial for enhancing telecom project managers' ambidextrous skills. The Project Management Institute ensures that professional certification will improve project performance (Aslam & Bilal, 2021). Effectiveness metrics should include project success rates and efficiency, supported by tools like Microsoft Project, Jira, and Asana.
- **Project Manager Networking and Collaboration:** Enhancing telecom project managers' ambidextrous skills through networking focuses on leveraging relationships to balance innovation and regular demands. This strategy fosters a collaborative culture where managers share ideas and engage in cross-functional teamwork, gaining diverse insights. Internal networking connects different organizational units, while external networking involves interactions with peers from other companies. Project managers are encouraged to join associations like PMI and Prince2 and participate in seminars and workshops to learn about industry trends and best practices.

(e) Telco Technology and Business Development Program (0.1913)

Technology and business development programs focus on industry-specific knowledge and innovation. Integrating technical expertise into leadership skills is needed in dynamic industries (Zaman et al., 2022).

- **Training and certification:** Enhancing ambidextrous leadership in telecom project managers requires a mix of technical and managerial expertise through specialized training. This includes identifying skill gaps and covering topics like 5G, IoT, Cloud and Cyber Security technologies, and telecom business models. Training should involve practice case studies, industry webinars, and project-based learning, while networking with professionals promotes continuous adaptation.
- **Innovation initiative:** Project managers must integrate technical expertise with innovative practices by setting clear goals for technology such as 5G, IoT, Cloud, and Cyber Security. Training should also focus on emerging technologies and approaches like design thinking. Creating environments for innovation and sufficient resources is vital, and environmental considerations should be integrated into these initiatives (Sitompul et al., 2024). This comprehensive, innovative approach strengthens leadership and industry-specific skills.

4. Conclusion, Implication, and Recommendation.

4.1. Conclusion

The results of Fuzzy AHP research as follows:

- a. Level Factor, ambidextrous leadership skills is the top priority. Effective stakeholder relationship management is crucial for project success, while project management skills and change management are essential but need to be more prioritized. Technical expertise in Telco is fundamental but secondary.
- b. Level Actor, the Project Manager is central to success, with the Company/Institution, Customer, and Project Team also critical, while the Project Management Association is less prioritized.
- c. Level Objectives, focus top priority on improving project performance, adaptability, stakeholder collaboration with PM leadership skills, and a learning and development culture supporting ongoing growth and resilience.
- d. Level Strategic Program, as the main objective of the research is to improve Telco Project Managers (PMs). The key strategies involve fostering ambidextrous leadership through several targeted programs.
 - The top priority is the Leadership Development Program, which centers on training, mentorship, and incentives to balance operational efficiency with innovation. This program highlights the importance of ongoing learning, organized mentorship, and reward systems to develop leaders who can enhance existing processes and pursue new opportunities.
 - The following strategy, the Change Management Development Program, plays a crucial role in integrating agile practices and adaptive work environments to equip PMs with skills to manage dynamic telecom projects effectively. This includes training on change models and agile methodologies and creating flexible workspaces to support adaptability.
 - Other strategies include the Stakeholder Relationship Development Program, which enhances project success through training in stakeholder management, CRM tools, and team-building activities.
 - The Project Management Development Program focuses on improving project management skills through training, certification, and networking.
 - Lastly, although ranked lowest, the Telco Technology and Business Development Program aims to advance industry-specific knowledge and innovation. These strategies emphasize leadership, change management, stakeholder engagement, and technical skills to develop well-rounded and adaptable project managers.

To sum up, the Leadership Development Program is a priority strategy to improve the ambidextrous leadership competence of Project managers in the Telco Industry. The program focuses on soft skills, namely leadership, change management, and stakeholder relationships, more than hard skills in Project Management and Telco technology and business.

4.2. Implications and Recommendations

Based on the findings of this research, practical programs for developing project manager leadership competencies have been detailed, and these results can serve as general competency standards required for project managers in the telecommunications field. This paper provides insights and guidance to academics, practitioners, and organizations by studying project managers in the telecommunications industry. It outlines the industry's current state and the specific needs and expectations for project managers within this sector. Further research is recommended to explore the implementation of development strategies using a scenario planning approach, considering two factors: the complexity of the project and the uncertainty of technology in telecommunications.

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