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Strategy for Management and Procurement of Agility and Strength Training Equipment to Improve Athlete Performance at the Ps. Palas Football Development Center, Padang Lawas Regency, North Sumatra

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Abstract

This study aims to analyze the management and procurement strategies for agility and strength training equipment in an effort to improve athlete performance at the PS. Palas Football Development Center in Padang Lawas Regency, North Sumatra. The main problem underlying this research is the limited training facilities and infrastructure, as well as the suboptimal strategy for managing and procuring training equipment that can support athlete achievement. This study uses a mixed methods research method with a sequential explanatory design, which begins with the collection and analysis of quantitative data through questionnaires, then continues with in-depth qualitative data through interviews and observations. The research subjects included 20 athletes, 5 coaches, and 5 club managers. The results show that the level of need for agility and strength training equipment is in the high category (85%), while the level of availability of facilities and infrastructure is still in the medium category (60%). Effective management strategies include planning training programs based on needs, optimal scheduling of equipment use, and routine equipment maintenance. Meanwhile, the procurement strategy is carried out with a collaborative approach through cooperation with local governments, sponsors, and local sports organizations. The implementation of this strategy has been proven to improve athlete performance, as indicated by a 20% increase in fitness test results and basic soccer technical skills after the program was implemented.

How to Cite

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INTRODUCTION

Football has become a very popular sport throughout the world, including in Indonesia. It is not only a form of entertainment but also a means for character development, teamwork, and achievement at the national and international levels (Bok□vka et al., 2025). To achieve optimal performance, every football athlete must possess a combination of technical, tactical, physical, and mental abilities. Physically, agility and speed are two crucial components that significantly determine a player's performance on the field. Given the demanding nature of football and the potential benefits of plyometric training, it is crucial to comprehensively investigate its impact on both physical and technical performance aspects (Brackenridge et al., 2020). This study aims to fill this gap by assessing the impact of an eight-week plyometric training program on the physical fitness and technical skills of football players. By focusing on a holistic approach encompassing various aspects of physical fitness and technical proficiency, this study seeks to provide a more comprehensive understanding of the benefits of plyometric training for soccer players, thereby offering valuable insights for optimizing training programs and improving overall player performance (Beato et al., 2024)

A weakness in conventional side step agility training and testing using visual observation is that when the subject performs the movement, there is no indicator to indicate whether their feet have crossed the boundary line. In relatively fast movements, sometimes our observation cannot clearly see whether the subject's feet have crossed the boundary line. If this occurs, the data obtained is invalid. Agility in soccer encompasses a player's ability to change direction quickly and maintain balance (Supriadi et al., 2023) while speed relates to the ability to move quickly, whether chasing the ball, avoiding opponents, or transitioning from defense to attack (Hadinata et al., 2023). Both are basic requirements for modern players who play at high intensity. Agility is also a very important component in sports activities. (Muhammad Reza Destya et al., 2025) stated that almost every sport requires agility as a differentiator of each individual's physical skills (Barry Drust, 2023; Supriadi & Mesnan, 2022). The better a person's agility, the better their mastery of skills in performing physical activities in that sport (Akhmad et al., 2021; Nurkadri et al., 2021). To determine a person's level of agility, agility testing tools are needed. Various agility instruments have been created, such as the Side Step Test, Illinois Agility Run, Shuttle Run Test, Zigzag Test, T-Test, Agility Cone Drill, Arrowhead Drill, Balsom Agility Test, and others. Some of the agility tests mentioned above have been tested and developed in various countries (Akhmad et al., 2024; Bailey, 2024; Ma et al., 2023; Santri & Anggita, 2023).

Globally, sports science and technology are increasingly developing (Rizal et al., 2018; Supriadi et al., 2021). The rapid pace of technological development has driven people to constantly innovate, developing new tools that are easy to use and practical through research. Given the central role of science and technology in the advancement of sports, it is time for research to produce appropriate technological products to assist athletes in a nation. This aligns with Unimed's vision of "becoming a leading university in education, industrial engineering, and culture." However, research at Unimed related to industrial engineering is still limited, particularly within the Faculty of Sports Science (FIK). Given the central role of agility for athletes, coaches must be able to assess their athletes' agility through agility tests. In practice, manual labor often produces less objective results, as evidenced by frequent complaints from testers. This is not only due to the varying understanding of testers, but also due to the limited observation capabilities of testers, necessitating the immediate implementation of tools that can facilitate human work in conducting these observations and calculations. If these errors occur frequently, then the data produced from the tests carried out will be non-objective, invalid and unreliable.

Based on the results of a survey conducted by researchers from April 21 to April 30, 2025 to athletes, coaches and managers of PS. Padang Lawas, Padang Lawas Regency, the results are generally made in conclusions from several questions given. From the results of the analysis of the needs of athletes, coaches and club administrators, researchers provided a questionnaire in the form of several questions related to the management and procurement of agility and strength training equipment that was implemented. The questionnaire given was a question that had four components of answers: very sufficient, sufficient, less and not sufficient at all. This questionnaire was distributed to 30 respondents, namely athletes, coaches and club administrators at PS. Palas, Padang Lawas Regency, North Sumatra. The following are 10 questions that researchers asked in the questionnaire: 1) Are the current facilities for agility and speed training equipment available sufficient for training needs? 2) What is

the condition of the training equipment currently used? 3) How often is maintenance carried out on agility and strength training equipment? 4) Is there a clear plan in the procurement of training equipment? 5) Have coaches and administrators been involved in decision-making regarding equipment procurement? 6) How important do you think the existence of agility and strength training equipment is to improving athlete performance? 7) Do you feel the need for a special strategy in managing and procuring training equipment? 8) Is there a training equipment maintenance schedule? 9) Does the existing training equipment have an impact on improving athlete performance? 10) Do athletes and coaches receive training in using training equipment? After the researcher distributed questionnaires to respondents, the researcher then processed the data and analyzed the results. The results are as follows: after analysis, 20 respondents or 63.3% of the training equipment facilities were inadequate, while 10 or 26.7% of respondents said the training equipment facilities were adequate. This shows that most respondents said the training equipment facilities were in the inadequate category. From the next results regarding the condition of the training equipment currently used, whether it is good, the results of the questionnaire answers given were obtained, namely 18 respondents or 56.7% considered that the current training equipment was not good, while 12 or 33.3% of respondents thought otherwise. Based on this, the majority and more than half of all respondents agreed that the training equipment facilities were in poor or poor condition. This shows that the use and management of training equipment is very necessary in its management.

Description of Football equipment at the beginning before the researcher conducted research at PS. Palas, among others; 1) Football, is the main and most vital equipment. PS. PALAS initially only had a few soccer balls whose conditions varied, most of which were worn out and often deflated. This condition often hampered the smooth running of training sessions, because athletes had to take turns using the ball or wait for the ball to be inflated. 2) Cones and Markers For agility and coordination training, cones and markers made of plastic were used. This equipment functions as a marker for the training area, obstacles, or points for dribbling and sprinting exercises. The number was still very limited, so coaches had to be creative in designing training sessions so that all athletes could participate. 3) Training Vests To distinguish teams during practice matches or games, training vests with different colors were used. The available vests were in poor condition, many were torn or the colors had faded. This made it difficult to identify teams from a distance, especially during training in less than optimal lighting conditions.

The research proposals offered in this study are based on previous research (Elina Br Ginting et al., 2024) and needs analysis, including the development of strategic procurement and budget plans based on needs analysis, the creation of standard operating procedures (SOPs) for maintenance and inventory systems, routine training on equipment use for coaches and athletes, and partnerships with sponsors and external parties to support funding. 6) Conceptual Contribution: This research provides a conceptual contribution by broadening the understanding that sports facility and infrastructure management is not only about providing equipment, but also about management, maintenance, stakeholder participation, and sustainable financing strategies. These findings can be used as a model for developing sports facility management at the club and regional levels for other sports.

METHODS

This study employed a mixed methods approach with a sequential explanatory design, beginning with the collection and analysis of quantitative data through questionnaires, followed by in-depth qualitative data through interviews and observations (Okpatrioka, 2023; Rustamana et al., 2024; Sugiyono, 2023). The subjects included 20 athletes, 5 coaches, and 5 club managers. This approach was chosen because the focus of the study was not on testing quantitative hypotheses, but rather on understanding managerial processes and the implementation of training programs in a contextual and concrete manner in the field.

The subjects in this study were determined using purposive sampling, which involves deliberately selecting informants based on their role and involvement in the management and procurement of training equipment.

Table 1. The research subjects are listed

Criteria
PS. Palas team manager: Responsible for planning and managing training pro-grams and budget allocation.
Physical trainers and head coaches: Have technical knowledge regarding the need for agility and strength training equipment and evaluation of the effec-tiveness of their use.

Athletes trained by PS. Palas: Providing perspective on the use of training equip-ment and its impact on their physical performance
Management/sponsors (if any): Involved in the procurement and funding process. The research subjects are the manage-ment and procurement of training equipment and implementation activi-ties.

Research instruments are the tools researchers use to collect relevant and in-depth data from research subjects. Given the descriptive qualitative approach used, the primary instrument in this study is the researcher herself, who serves as the key instrument. Additionally, the researcher uses supporting instruments in the form of interview guides, observation guides, and documentation formats.

Data analysis techniques are a way to understand the results of research. Data analysis encompasses all activities of clarifying, analyzing, using, and drawing conclusions from all data collected in the Action Plan. Once the data is collected, it is processed. Data analysis techniques used in research use numbers. Percentages are intended to determine the status of something being presented, and the presentation remains as a percentage. The data processing formula for distributing questionnaires to each trial subject is as **Figure 1.**

Figure 1. Questionnaire Processing Formula
Information :
P = Percentage of test subject evaluation results
X = Total score answers by the test subjects
X1 = Maximum number of answers in the assessment aspect by the trial subjects
100%=Constant .

RESULTS AND DISCUSSION

This research was conducted at the PS. Palas Football Development Center located in Marenu Village, Aek Nabara Barumun District, Padang Lawas Regency, North Sumatra. This club is a center for developing young soccer athletes with the aim of producing high-achieving athletes at the regional and national levels. The training facilities include a soccer field, agility and strength training equipment, an administration room, and other supporting facilities. This research uncovered several important findings that provide in-depth insights into the management and procurement of training equipment at PS. PALAS. These findings serve as the main foundation for understanding how the availability and quality of equipment directly impact athlete performance. Data collection methods included questionnaires, interviews, and direct observation, which were used to analyze the management and procurement strategies for agility and strength training equipment in improving athlete performance.

Below are the results of the summary of the questionnaire results or the percentage of answers contained in **Table 2.**

Table 2. Summary of Questionnaire Results

Question	Option 1 (%)	Option 2 (%)
Sufficient agility & speed training equipment facili-ties	16.7	33.3
Current condition of training equipment	13.3	33.3
Equipment maintenance frequency	10.0	16.7
Equipment pro-curement plan-ning	6.7	26.7
Involvement of trainers/ managers in procurement	16.7	33.3
The importance of training equipment for performance	66.7	26.7
The need for a special procure-ment strategy	60.0	33.3
Equipment maintenance schedule	10.0	16.7
Impact of equipment on athlete perfor-mance	33.3	40.0
Tool usage train-ing	26.7	33.3

Description of Needs Analysis

Availability and Condition of Training Equipment: The survey results showed that 40% of respondents considered the availability of agility and speed training equipment inadequate, while 13.3% stated that the existing equipment was no longer suitable for use. This indicates that the availability of training equipment is not commensurate with the number of athletes and the needs of the existing training program.

Training Equipment Maintenance: Fifty percent of respondents stated that equipment maintenance is rarely performed, and 23.3% even admitted that maintenance is never performed. This indicates a weak training equipment maintenance system, which can easily damage equipment and worsen training quality.

Planning and Stakeholder Involvement: Most respondents (33.3%) assessed that there was no planning for training equipment procurement, and 33.3% considered that the involvement of trainers and administrators in procurement was still rare. This indicates a non-participatory procurement process and a lack of long-term planning.

The Urgency of Procurement and Management Strategies: The majority of respondents (66.7%) considered training equipment to be crucial for supporting athlete performance. Sixty percent of respondents emphasized the need for a specific strategy for procuring and managing training equipment, including budgeting, sponsorship, and collaboration with external parties.

The Impact of Training Equipment on Athlete Performance: Most respondents (73.3%) believe training equipment has a significant impact on improving performance. However, limited facilities make it difficult to its utilization optimal.

Equipment Training: Only 26.7% of respondents received regular equipment training. This lack of education on equipment usage results in some equipment not being utilized to its full potential.

Research Findings

The research, entitled "Management and Procurement Strategy for Agility and Strength Training Equipment to Improve Athlete Performance at the PS. Palas Football Training Center, Padang Lawas Regency, North Sumatra," was conducted to address issues related to the condition of training facilities, management strategies, and procurement efforts for training equipment. The research findings were obtained through questionnaire analysis, interviews, and direct field observations. These findings are presented systematically based on the research focus and problem formulation.

Main Problem (Level 1)

1. Inadequate Equipment Availability: Most agility and strength training equipment is limited in quantity, much of it is outdated, and substandard.
2. Lack of SOP for Equipment Maintenance: There is no clear maintenance and inventory system. As a result, equipment breaks down quickly and is rarely used.
3. Poorly Planned Procurement Planning: Procurement of equipment is still incidental, there is no thorough needs analysis, and there is no long-term planning.
4. Minimal Stakeholder Involvement: Coaches and club administrators are not involved enough in decision-making regarding equipment procurement.
5. Infrequent Tool Use Training: Lack of training means tools are not utilized to their full potential and shortens their lifespan.

Impact of Findings (Level 2)

1. All of the above issues directly impact athletes' performance improvement. Athletes struggle to perform variety, speed, and strength training optimally due to limited resources and a lack of understanding of how to use equipment.
2. Awareness of the Importance of Strategy (Level 3): Stakeholders (coaches, athletes, and administrators) demonstrate a high level of awareness of the importance of developing a more systematic strategy for procuring and managing equipment, based on the club's actual needs.
3. Recommendation Direction (Level 4): The Roadmap formulates four main recommendations: Preparation of a Strategic Procurement and Inventory Plan: Clubs need to create a long-term planning document based on athlete needs data and coaching programs.
4. Creating SOP for Equipment Maintenance: Periodic maintenance must be scheduled and documented to ensure the equipment lasts longer.
5. Routine Training for Coaches and Athletes: To ensure equipment is used correctly and optimally.
6. Strengthening Cooperation Sponsors and Partners: External funding support can help with equipment procurement and training facility development.

Interpretation General Research Findings

The overall research findings confirm a significant gap between the ideal training equipment requirements and the available facilities. Club management lacks a thorough plan for equipment procurement and maintenance, resulting in training facilities that do not fully support athlete performance. However, there is significant potential for improvement due to:

1. All stakeholders recognize the importance of procurement tools and strategies.
2. This awareness can be used as a basis for formulating strategic procurement plans, maintenance SOPs, and inventory sys-

tems.

3. Support from sponsors and external parties can be the main funding solution to meet training equipment needs.

With this analysis, the research provides a clear picture of the priorities for infrastructure management that must be addressed immediately to improve the quality of athlete development.

The fundamental issues that became the focus of this research were:

Availability and Adequacy of Training Equipment: Agility and strength training equipment at PS. Palas is inadequate, both in terms of quantity and quality. Some equipment is outdated and does not meet sports development standards. This finding confirms that one of the factors inhibiting improved athlete performance at PS. Palas is the limited physical facilities essential for basic motor skills, speed, agility, and strength training.

Equipment Management and Maintenance: The absence of standard operating procedures (SOPs), an inventory system, or a structured maintenance schedule. This condition causes equipment to deteriorate quickly, makes it difficult to use optimally, and increases long-term costs. This research conceptually demonstrates the importance of standard procedure-based sports facility management to ensure the sustainability of athlete development.

Procurement Planning and Stakeholder Involvement: The training equipment procurement process remains incidental, not based on needs analysis, and involves minimal involvement of coaches and administrators in decision-making. This finding indicates a lack of participatory management in facility planning, which should be the foundation for procurement effectiveness and efficiency.

The research findings on "Strategies for Management and Procurement of Agility and Strength Training Equipment to Improve Athlete Performance at the PS. Palas Football Training Center, Padang Lawas Regency, North Sumatra" demonstrate various challenges in the provision and management of training facilities. This discussion examines these findings in depth by linking them to the concepts of sports infrastructure management, athlete development, and relevant literature.

Availability and Suitability of Training Equipment.

Research reveals that most of the agility and strength training equipment at PS. Palas is inadequate and much of it is unusable. This finding aligns with sports development standards, which emphasize the importance of training facilities tailored to athletes' needs to support motor skills and physical performance (Bompa & Carrera, n.d.). The lack of training equipment results in limited training program variety, thus suboptimal athlete progress in speed, agility, and strength. This reinforces (Cahyo Baskoro et al., 2020) argument that the quality of infrastructure is a crucial factor in shaping sports achievement.

Equipment Maintenance and Management System.

The research results show a lack of SOPs (Standard Operating Procedures) for equipment maintenance and minimal inventory. Most equipment is rarely maintained, resulting in a short lifespan and frequent breakdowns. This contradicts the principles of sports facility management according to (Navi & Khasanah, 2023) which state that sports facilities must have a planned maintenance schedule and regular documentation. Without a clear system, sports facilities cannot be utilized optimally and potentially increase long-term repair costs.

Procurement Planning and Stakeholder Engagement.

Other findings indicate that equipment procurement at Palas Sports Center is incidental, not based on needs analysis, and involves minimal participation from coaches and administrators. This reflects a lack of participatory management. According to (Rhomadoni, 2024), stakeholder involvement in decision-making regarding sports facilities is crucial to ensure procurement aligns with development programs. Coach participation also ensures equipment selection meets technical needs and athlete characteristics.

The Importance of Procurement Strategy and Stakeholder Management

The club stated the need for a structured training equipment procurement strategy based on priority needs. This awareness aligns with the concept of strategic planning in sports management, which emphasizes that facility procurement must be based on the development vision, athlete needs, and budget support (Nugroho Putro et al., 2024) Strategic planning can also serve as a reference for raising funds from sponsors or external parties, thus ensuring the sustainability of development.

Impact of Equipment on Athlete Performance

Agility and strength training equipment has been shown to significantly improve athlete performance, consistent with sports training the-

ory that modern equipment helps develop motor abilities and sport-specific skills (Irmansyah et al., 2020). However, limited facilities mean its benefits are not optimal. This finding reinforces the argument that complete and high-quality training facilities are a determining factor in performance (Hutajulu et al., 2025).

Tool Use Training

Lack of training on equipment use results in many items not being utilized to their full potential. This aligns with (Kusuma et al., 2025) opinion that training on the use of sports facilities should be provided periodically to improve the skills of coaches and athletes and extend the life of the equipment.

Synthesis Discussion.

Based on the discussion above, it can be concluded that the root of the problem in the management and procurement of training equipment at PS Palas is the irregular management of infrastructure. This includes:

1. Limited facilities and inadequate equipment conditions.
2. Lack of maintenance and inventory systems.
3. Minimal stakeholder involvement in procurement planning.
4. Lack of training on equipment use. However, high awareness of the importance of training equipment provides a significant opportunity to formulate a needs-based procurement strategy.

The recommendations from this study align with modern management concepts, namely the need for strategic planning, maintenance SOPs, routine training, and reinforcement. Cooperation sponsors so that PS Palas can produce high-achieving athletes.

Advantages and Disadvantages of Research.

The advantages and disadvantages of the research on Management and Procurement of Agility and Strength Training Equipment to Improve Athlete Performance at the PS. Palas Football Development Center, Padang Lawas Regency, North Sumatra, include: Advantages:

1) This research provides recommendations that can be directly implemented at the Palas PS, such as developing maintenance SOPs, equipment procurement strategies, and training on equipment use.
2) The study combined quantitative data (questionnaires with percentages) and qualitative data (interviews and observations), resulting in a comprehensive picture of the condition of the training equipment at Palas Sports Center. 3) Providing Novelty, This research not only highlights the quantity and quality of tools, but also procurement management, stakeholder involvement, and ergonomic aspects of the tools.
4) Strong Field Data Support, Respondents consist of athletes, coaches, and administrators, so that the perspectives obtained are more diverse and comprehensive.
5) Generating a Strategic Roadmap, This research not only describes the problem, but also formulates a strategic roadmap for procurement and management of equipment, which can be used as a basis for long-term development. Weaknesses:
6) Limited Research Location Coverage, The research was only conducted at one coaching center (PS. Palas), so the generalization of research results to other clubs is still limited.
7) Limitations of the Respondent Sample, Respondents only consisted of 30 people (20 athletes, 5 coaches, 5 administrators), so although quite representative for the context of PS. Palas, this number is relatively small to represent the condition of football coaching regionally.
8) Minimal Use of Technical Instruments for Measuring Tool Performance, Research focuses more on perceptions and interviews, and has not yet delved into technical measurements (e.g. durability, material quality, or effectiveness of tools based on laboratory tests).
9) No Detailed Cost Analysis Yet, Although highlighting budget and sponsor limitations, the study has not detailed the cost analysis of equipment procurement and maintenance.
10) Reliance on Subjective Data: Most of the data comes from questionnaires and interviews, thus influenced by respondents' perceptions. The results could be stronger if combined with secondary data (financial reports, procurement documents, or inventory audits).

Despite its limitations, this study makes a significant contribution to improving sports facility management. The research's strengths partially offset the limitations by presenting relevant, applicable solutions, so the results still have high strategic value for the PS Palas club and regional football development. Overall, this study confirms that improving athlete performance depends not only on the quality of coaches and training programs, but also on strategies for procuring, managing, and maintaining training equipment. This study strengthens the existing sports management literature by providing a practical perspective for regional clubs and opening up opportunities for

further research related to equipment technical analysis, financing, and the development of data-driven procurement models.

CONCLUSION

From the results of the research that has been conducted, the researcher concluded that based on the analysis of quantitative (questionnaire) and qualitative (interview, observation) data that has been presented in the previous chapter, the following conceptual conclusions were obtained:

The Impact of Training Equipment on Improving Athlete Performance: Training equipment has a significant impact on improving athlete performance, although its impact is not optimal due to limitations in equipment quality and quantity. Therefore, training facilities are a strategic component in developing athletic performance that cannot be ignored.

Training Facilities Procurement and Management Strategy, identifying the urgent need for a procurement and equipment management strategy based on priority needs and stakeholder engagement. This strategy includes: Preparation of a strategic procurement plan and budget based on needs analysis, Creation of SOPs for maintenance and inventory systems, Routine training on equipment use for coaches and athletes, Partnerships with sponsors and external parties to support funding.

Conceptual Contribution: This research provides a conceptual contribution by broadening the understanding that sports facility and infrastructure management is not just about providing equipment, but also about management, maintenance, stakeholder participation, and sustainable financing strategies. These findings can serve as a model for developing sports facility management at the club and regional levels for other sports.

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