AHP-SWOT ANALYSIS FRAMEWORK PROPOSED FOR CRICKET PLAYERS’ PERFORMANCE ANALYSIS

ZAMAN ASHRAF¹, M. AHMAD NAWAZ UL GHA NI²

¹Department of Software Engineering, University of Management and Technology, Lahore, Pakistan
²Department of Software Engineering, University of Management and Technology, Lahore, Pakistan
Email: {S2010114007¹, 15007114021²}@umt.edu.pk

ABSTRACT. Cricket is one of the most popular game in the world and competition is increasing among the teams. Every cricket board is putting its resources to search the best players and train them to overcome their opponents. For this, they use different tools and techniques to judge the abilities and weakness of the players. We are presenting a tool known as SWOT analysis through Analytic Hierarchy Process (AHP) that can help players to grow stronger and find potential opportunities. SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis is a widely used technique for analyzing external and internal components and find out an efficient method to support for the decisions. The proposed technique is acquired by performing Analytic Hierarchy Process (AHP). In conclusion, the SWOT and AHP integration may provide great assistance to cricket board in determining the best players that play an important role in winning the cricket match.

Keywords: SWOT Analysis; AHP; Performance Analysis; Cricket Player.

1. Introduction. Cricket plays internationally, that’s why this game have great competition. They have their own rules and regulations but still on some critical situations it required systematic way to overcome the situation. Here we are presenting a technique that can help cricket board to choose best players and also help players to grow up and find potential opportunities. For this, they use different tools and techniques. Here we are presenting a technique that can help cricket board to choose best players and also help players to grow up and find potential opportunities. This tool is known as SWOT analysis through Analytic Hierarchy Process (AHP). SWOT analysis is valuable in exploring opportunities for new efforts or answers the problems to making decisions [1]. The word SWOT is a contraction of Strengths, Weaknesses, Opportunities and Threats. It consists of two types of factors, internal and external. SWOT analysis helps for extensive view on current and previous performance of the cricket players and analyze the future performance of players considering external and internal factors. In this research, a SWOT analysis has been proposed to figure out the performance of players among SWOT factors systematically.

SWOT analysis not responsible for an analytical means to decide the significance of the identified factors. The AHP technique used to compute the weights of assessment criteria [4]. Analytic Hierarchy Process (AHP) is a multilevel decision making method which allow to decomposing the selection problem of cricket players in multilevel hierarchical structure to find the best players [6]. In our work we will proposed how this analysis can be applied to sports. The proposed AHP-SWOT framework can be used for all stakeholders including players, coach, team managers, and team captains themselves to identify their internal factors and explore external factors to maximize their performance. In conclusion, the SWOT and AHP integration may provide great assistance to cricket board in determining the best players that play an important role in winning the cricket match.

2. Related work. To identify threats and opportunities in Iran about Climbing’s sport [1]. They collect information from library, survey forms and internet and then apply SWOT analysis on the collected data. A questionnaire designed that was consisting of 35 substances and approved it validity by 12 instructors and climbing specialists. Excel and SPSS software used to analyzing the data, Chi-squared and Friedman tests.
They concluded that Iran has 17 opportunities and 18 threats in climbing sport and by utilizing the resources in right way and using opportunities it could be possible to terminate many of weaknesses and threats of this field [2].

Presently companies are in race position and need to have valuable knowledge related their business to help them to survive in the market. Distribution companies also face the business problems. This research [3] is present the quantitative fuzzy Analytic Network Process that based on SWOT analysis to set order with SWOT factors related to distribution company. SWOT matrix is a main technique for management to analyze the other strategies and try to find best way for their own business. ANP technique is the reorganized form of the AHP technique. It is more effective in hard situations when some factors have reactions on each other. Due to Qualitative decision making often face the ambiguity and uncertainty. In this study we describe the fuzzy logic with Analytic Network Process to control the ambiguity and criteria effects in pairwise comparison and the recommended SWOT fuzzy Analytic Network Process technique is tested and implemented for the Distribution Company [3].

Organizations need to be aware with development opportunities in environment and make the techniques to respond them creatively [5]. In Andrews SWOT analysis they describes that a firm make a long term planning to carefully classify the factors of its external and internal environment. This allows making the long term planning approach that is depends on qualitative analysis instead off quantitative analysis. Using of SWOT matrix they proposed a technique that calculate the strengths and weaknesses is the internal factors, and threats and opportunities is the external factors in the firm environment. In [5] they also discuss the formulating strategy framework. Generating the external and internal factor is the difficult section for generate the SWOT matrix and requires the attention of the experts. In this study they use SWOT matrix that helps in developing the four types of strategies like SO (strengths-opportunities) approaches, WO (weaknesses-opportunities) approaches, ST (strengths-threats) approaches, and WT (weaknesses-threats). SO (strengths-opportunities) is for internal strength to take benefit from external opportunities. ST (strengths-threats) in [5] they used firm strength to reduce the external threats. WT strategy use to reduce internal weaknesses and avoid from environmental threats. In the previous researches they figure out the eight steps for developing a SWOT matrix (is) collect the primary external opportunities, (ii) collect the primary external threats, (iii) collect the primary internal strengths, (iv) collect the primary internal weaknesses, (v) integrate the external opportunities with internal and find out the results of SO (strengths-opportunities) strategies, (vi) integrate the external opportunities with internal weaknesses and find out the WO (weaknesses-opportunities) strategies, (vii) integrate the internal weaknesses with external threats and collect the result of ST strategies, and (viii) integrate the internal weaknesses with external threats and collect the result of WT (weaknesses-threats) strategies. SWOT analysis is used in various fields due to its above describe strategic steps.

In [8] Research present the particular arrangement of SWOT analysis and Analytic Hierarchy Process (AHP) in strategic planning for the tourism department of small European City Varazdin. SWOT analysis highlight the internal and external factors which is computed by the expert in tourism domain by means of AHP. They used the computed SWOT factors in strategies formulation using SWOT matrix. In this study they point out that aggressive strategy and isolation strategy with real promotional strategy is the best strategies that have been implemented.

3. Experimental design. SWOT analysis framework is purposed to identify the internal and external factors of a cricket player. SWOT analysis have four parts: strengths, weaknesses, opportunities, and threats. Below Fig.1 describe how the SWOT investigation fits into an environmental scan. SWOT technique useful for the Corporate Strategy Management analysis to find out the corporate weakness, strength and main capability according to the set of conditions [9]. SWOT method is broadly used in strategic management areas and competitive intelligence [10-12].
As diagram describe that, the environmental scan provide the internal and external factors in which external factors deals with the opportunity and threats and internal factors describe about the strength and weakness about the performance of the players. For SWOT analysis some basic and important information is required to analyze about the player performance. Personal Information, Batting Information and Bowling Information is collected through:

- Observation
- Questioners
- Expert feedback

The SWOT analysis is to set the objective for the players and identify the suitable or unsuitable conditions by gathering the internal and external factors. For ease strength is an advantage over other, weakness is comparative disadvantage over others, opportunity used for our advantage and threat is causes that can be decrease the performance of player. Here are some explanations of the player information that is required for our proposed framework as shown in the Table 1.

| Table-1: players general Information |
|-------------------------------------|
| **General Information** | **Playing Role** |
| Complete Name | Batsman |
| Date of Birth | Bowler |
| Team Name | All-rounder |
| Country | |
| Sex | |

We apply SWOT analysis with the help of this information through questioners, observation and expert feedback. AHP is a multilevel decision making method which allow to decomposing the selection problem of players in multilevel hierarchical structure to find the best cricket players [6]. Analytic Hierarchy Process performed pairwise comparison to find the significance of each player in each level of hierarchical structure and evaluate the substitute’s players in lower level of the hierarchical structure to make the best decision among all other options of players. AHP used to scale the batsman, bowler and performance of all other players with continuous and discrete pairwise comparison in multilevel hierarchical structure. Saaty (1980) mechanism is highly trained in assigning a number from a comparison scale in the below table 2 to represent the relative importance of the decision criteria.

| Table-2: Pair-wise compression scale. |
|--------------------------------------|
| **Importance** | **Explanation** |
| 1 | Both players are equally important |
| 3 | Less important to other player |
| 5 | Strongly important |
| 7 | More strongly important |
Analytic Hierarchy Process technique is created on three principles: first principle for the structure of the model; second principle for the comparative judgment of the player performance; third principle for the combination of the players. Analytic Hierarchy Process only presents a framework with a single directional hierarchical AHP relationship and the Analytic Network Process permits for complex interrelationships among decision levels and attributes. The figure A and figure B represent the difference of ANP and AHP. AHP comparisons based on a standardized nine levels comparison scale [26]. Normalized the SWOT matrix and find the relative weights that given by the Eigenvector \( w \) equivalent to the highest eigenvalue.

\[
A_w = \lambda_{\text{max}} \cdot w
\]

The Analytic Network Process is used for the problems that are not structured hierarchically. Fig.2 describe the hierarchy of the SWOT matrix.

![Hierarchical Structure](image)

**Figure-2:** Hierarchical structure.

4. **Implementation.** We apply SWOT analysis framework on one of Pakistani player Muhammad Hafeez and get all relevant information to apply SWOT: as shown in the Table 3 representing the sequence of tables

| General Information | Muhammad Hafeez |
|---------------------|-----------------|
| Complete Name       | Complete Name   |
| Date of Birth       | Date of Birth   |
| Team Name           | Team Name       |
| Country             | Country         |
| Sex                 | Sex             |

| Playing Role | Questions | Answers |
|--------------|-----------|---------|
| Batsman      |           | ✔️      |

Table-3: Casestudy approach.
## Opportunities

| Questions                           | Answers                         |
|-------------------------------------|---------------------------------|
| Shots that batsman need to learn?   | Off Side and Mid Cover Shots    |
| On which inning batsman play well?  | First Inning                    |
| On which bowler against batsman play well? | Bret Lee, Suresh Raina      |
| Coaches need to improve batsman performance? | Micky Aurthur, Gary Kirsten.  |
| On which team against batsman plays well? | Bangladesh and Newzeland     |

## Bowling Information

| Questions                      | Answers                           |
|--------------------------------|-----------------------------------|
| Bowling Style                  | Right-arm off Spin                |
| Bowl line                      | Wide Off Stump, Stumps            |
| Over gets                      | PP1 PP2 PP3                       |
| Which kind of runs bowler commonly give? | 1 2 3 4 5 6 7 8 9 10 11 |
| Bowler expert in bowling style? | Off Spin, and Reverse Swing       |
| Ball length                    | Short Length                      |

## Batting Information

| Questions                  | Answers                                    |
|----------------------------|--------------------------------------------|
| Right hander               |                                            |
| Batsman playing position   | 1 2 3 4 5 6 7 8 9 10 11                   |
| Batting Shots              | Attack and Front Foot                     |
| Score types                | Singles & Boundaries                      |
| Batsman Shots Zone         | Cover and Straight                        |

## Threats

| Questions                              | Answers                              |
|----------------------------------------|--------------------------------------|
| On which type of bowling batsman not play well? | Spin bowl and Yorker. |
| On which Arm bowler batsman not play well?  | Right Arm                             |
| Which shot give tuff time to bowler?     | Leg Shot                              |
| Which fielding zone bowler get more runs? | Straight and Off Zone                |
### Weaknesses

| Questions                              | Answers                                           |
|----------------------------------------|---------------------------------------------------|
| Below the average position of batsman  | 6th position                                      |
| On which inning batsman not play well  | Second Inning                                     |
| Which shots batsman not play well?     | Off Side and Mid Cover Shots                      |
| Effects of change the position of batsman? | Perform below the average.                     |
| On which team against batsman not plays well? | West Indies and Australia.                  |
| On which bowler against batsman not play well? | M.Nabi                                          |
| On which fielding zone batsman not play well? | Cover and Mid-Wicket Zones.                     |
| In which match type batsman not play well? | T-20 Match                                       |
| In which ground venue batsman not play well? | National (Home Ground)                          |

### Strengths

| Questions                              | Answers                                           |
|----------------------------------------|---------------------------------------------------|
| Batsman Usually playing Position       | Opening                                           |
| On which inning batsman play well      | First Inning                                      |
| Which shots batsman mostly play?       | Edge and Cover Shots                              |
| Alternative batting position for that batsman if they not play well on current position. | 4th position                                      |
| On which team against batsman plays well? | India and South Africa                           |
| On which bowler against batsman play well? | Shane Waston                                     |
| On which fielding zone batsman play well? | Straight and Leg Zones                           |
| Against how many teams batsman is play in full career? | Against 12 international team batsman play in full career. |
| In which match type batsman play well?  | One Day                                           |
| In which ground venue batsman play well? | International                                    |
5. Conclusion. This research, determined the significant strategic factors to find the best players and train them to overcome their opponents by combining SWOT with AHP techniques. The calculated weights of SWOT factors could be used to develop an approach to identify their internal factors and explore external factors to maximize their performance. Our proposed method enhance the young talent performance and help them to find the right opportunity to overcome the threats and convert the weakness into strengths. As in our analysis, we found some common similarities between different batsmen and bowlers. Like their ball type, fielding region or bat shots they like to play most and our SWOT analysis of different players show that where they lacks and which opportunities are there that they can avail and improve themselves.
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