Integrating Balanced Scorecard with Fuzzy Linguistic and Fuzzy Delphi Method for Evaluating Performance of Team Sports (SANAT NAFT NOVIN Abadan Football Club)

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ABSTRACT

In the last decades an increasing number of clubs, associations, and partnerships behind professional team sports have become business enterprises as well; as regards their income and number of employees, there are numerous companies managing sports clubs in the medium sized enterprise sector. By nature of being businesses that manage sports, successful performance is usually the number one strategic consideration. An efficient performance evaluation system is essential for controlling, monitoring and improving team sports. This paper explores the use of a management tool: balanced scorecard (BSC), which facilitates managers to meet multiple strategic goals, and fuzzy linguistic method for evaluating team sports performance. BSC is a strategic planning and management system that is used extensively in business and industry, government and nonprofit organizations. First, Twenty-five measures of sustainable performance were recognized through expert questionnaires and through the fuzzy Delphi method (FDM), then a model is developed for measuring the acceptable performance of team sports based on the interaction financial, customers, internal business process and learning and growth perspective. After that, BSC structure integrated with fuzzy linguistic is proposed for measuring and improving the quality. The aim of this study was to build a performance evaluation system for team sports and use a fuzzy linguistic to convert the subjective cognition of managers into an information entity and confirmation of improvement.

Keywords

Fuzzy linguistic approach, Fuzzy Delphi Method, Balanced Score Card, Team Sports

1. INTRODUCTION

Efficient and accurate performance measurement systems serve as a useful tool enabling managers to control, monitor and improve the performance of businesses managing sports associations or sports club faces considerable strategic challenges and strong pressure to become more responsive to customers' demands by simultaneously improving quality and efficiency. This situation imposed the traditional performance measurement and management control systems are insufficient guides for achieving multiple strategic objectives. As a consequence, organizations such as companies managing team sports are required to improve their performance for multiple stakeholders and deliver an integrated care that means to work effectively, be innovative and organize efficiently. Performance measurement is a multidimensional structure involving the various components which contribute differently to overall performance. Constructing and possessing available performance measurement tools not only increases evaluation efficiency but also saves costs. Traditional performance measurements generally use financial aspects to measure performance. The most significant limitation is that they emphasize the operational results, but not the internal process, which would result in ignoring forecasting function and lacking a long-term orientation. In this way, to develop and manage a suitable business strategy, a growing number of sports companies use processes applied in business solutions; the German football team VFB Stuttgart can be seen as an example , being the first in BUNDESLIGA to introduce the Balanced Scorecard method for the definition of strategic directions and process control [1] .BSC is a customer-based planning and control system that helps managers to translate strategy into an integrated set of financial and nonfinancial measures [2]. Recently, many researchers have been developed and modified fuzzy linguistic approach in order to

apply in diverse domains. A fuzzy multi-criteria approach for evaluating environment performance of suppliers was presented [3] .They used linguistic assessment to rate the criteria and the alternatives, and then combined through fuzzy TOPSIS to generate an overall performance score for each alternative. And the proposed approach can be practically applied in evaluating environmental performance of suppliers. An effective and convenient performance evaluation model based a fuzzy AHP for implementing SPC in the Taiwanese LCD industry was proposed [4]. The study demonstrates that the proposed model is an effective and convenient tool that can be used to analyze and improve the performance of an existing SPC system or to enhance success in implementing a new SPC system while working within constraints of time and costs. A fuzzy linguistic method proposed for evaluating collaboration satisfaction of NPD team using mutual-evaluation information [5]. The method is suitable to process linguistic information and could be embedded in decision support system to support managers/decision-makers in the process of NPD. This research proposed an effective and efficient team sports performance evaluating procedure by combining the BSC structure with a fuzzy Delphi method and a fuzzy linguistic to convert the subjective cognition of managers into an information entity.

2. BASIC CONCEPTS

2.1 Balanced Score Card

BSC was originally developed by Kaplan and Norton as a performance measurement tool for managers to obtain a quick, yet comprehensive view of how their businesses were operating [6]. It added strategic non-financial performance measures to traditional financial metrics to give managers and executives a more 'balanced' view of organizational performance. It is used extensively in business and industry, government, and nonprofit organizations worldwide to align business activities to the vision and strategy of the organization, improve internal and external communications, and monitor organization performance against strategic goals [6].The success of BSC or a similar device will depend on the clear identification of non-financial and financial variables and their accurate and objective measurement and linking the performance to rewards and penalties. The aim of BSC is to direct, help manage and change in support of the long term strategy in order to manage performance. In general, a BSC system is considered to be a performance measurement system, a strategy evaluation system, and a communication tool, at the same time, defined by the following four distinct perspectives [2]. And they [7] argued that the BSC program is a cause-and-effect relationship among different measurements in the selected perspective.

- The learning and growth perspective includes studies in connection with the skills and motivation of employees. Organizational growth can be realized if all employees are aware of the corporate strategy and can identify with it. It is important for the organization to have the ability to change through its employees and in order to achieve this, its workers, coaches have to be trained continuously, and a proper information base has to be established for the implementation of processes. The continuous improvement of trainings, the development of sections of talent care (additional trainings, sports psychology, etc.) can be aspects of growth.
- The internal processes perspective refers to internal business processes. Metrics based on this perspective allow the managers to know how well their business is running and whether .its products and services conform to customer requirements. These metrics have to be carefully designed by those who know these processes most intimately; with unique missions these are not something that can be developed by outside consultants.
- The customer perspective emphasizes the satisfaction of the customers. In the case of businesses managing sports clubs, we can define various customer segments, target groups: visitor and fan groups, sponsors, and the parents behind reserve teams. These groups differ not only in terms of their composition and structure but also because for the particular customers different achievements serve as components of performance. In all three cases satisfaction, preservation, and growth can serve as acceptable measure of success, however different customer value propositions have to be placed in the center of strategy in the different cases.
- The strategic aspect of financial perspective is the development of an enterprise of solid capital which is able to finance operational costs and necessary investments. Financial objectives are usually connected to profitability, typically through the increase in income and the return of invested capital. The long term proprietors value, as the main goal in the financial perspective, includes two strategies: improvement of cost structure (reduction of expenses, solution of deficiencies), improvement of asset management; extension of income opportunities (new income sources), increasing of customer value. In the case of profit-oriented companies, the increase of shareholder value is the number one financial objective, for the achievement of objectives in the profession of sports, the financial perspective aids the realization of strategy.

The four perspectives of BSC is depicted in figure 1.

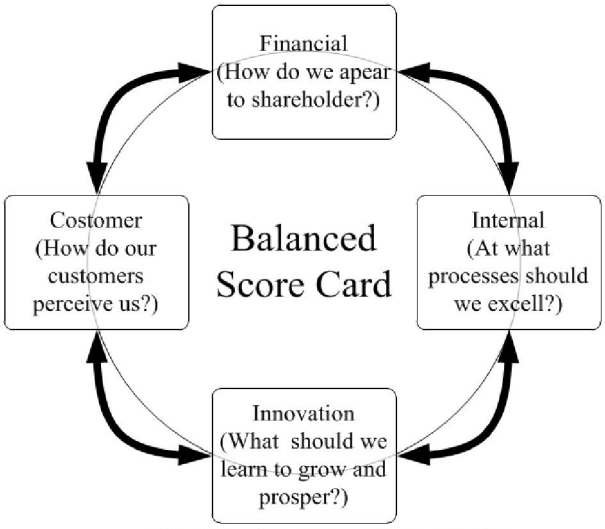

Figure1. Four perspectives of BSC

BSC helps everyone in an organization understand and work towards a shared vision. A completed scorecard system aligns the organization's picture of the future, with business strategy, desired employee behavior and day-to-day operations. It is therefore a very important strategic management tool which helps an organization not only to measure performance, but also decide (manage) the strategies needed to be adopted (modified) so that the long-term goals are achieved [8]. BSC gives us a valuable tool for enabling employees to understand the company's situation, a must if the company is to achieve the dynamism it needs to be competitive in the long run. It also provides us with useful documentation for continually developing those measures for control which most quickly will guide the company towards achieving its goals and its vision. As previously noted, the exact arrangement and thus also the time allotted must be adapted to the characteristics and situation of each company.

2.2 Fuzzy Delphi Method

The Delphi method has been widely used and recognized in making predictions and in decision-making since its launch at RAND Corporation [9]. The Delphi method was conceived as a group technique that aims to obtain the most reliable consensus of a group of experts by means of a series of intensive questionnaires with controlled opinion feedback [10]. Despite its recognition as a valuable tool, it has some drawbacks. The tool is time consuming, and converging results through repetitive surveys is costly [11,12,13].

Further, the problems of ambiguity and uncertainty still exist in the responses of experts [11,13, 14]. To solve these defects, the concept of the traditional Delphi method and the fuzzy set combined to alleviate the ambiguity of the Delphi method [15]. In addition, another more complete FDM procedure proposed, in which the fuzzy set theory is used by asking participants to give a three point estimate (pessimistic, moderate, and optimistic values) [16] . Triangular fuzzy numbers (TFNs) are then formed, and their means are computed. By incorporating TFNs to locate three points in the extent of importance (with a scale of 0–10 points), this study applied paired TFNs. The same concept was adopted by Wei and Chang (2008) to calculate and depict these ''group average'' values. The paired TFNs were categorized into two: the conservative TFN (CL, CM, CU) and the optimistic TFN (OL, OM, OU). The intersection of the fuzzy opinions of experts implies the convergence of consensus. Lastly, the geometric means of conservative, moderate, and optimistic values (Ci, ai, Oi) were computed to acquire the consensus values (Gi) of each item. In view of the advantages of FDM in evoking expert-group opinion, various studies [15,17] have embraced the FDM in constructing performance indicators or evaluation criteria. Some essential FDM steps are as follows [17,18]:

Step 1: Administer the questionnaire and organize an appropriate panel group for experts to express their most conservative (minimum) and optimistic (maximum) values for each item in
a range of 1–10.

Step 2: Gather the most conservative (minimum) and optimistic (maximum) values of each expert for each item and compute the geometric mean of the expert group's opinion. Calculating the conservative and optimistic values of each item i, which is outside of the two standard deviations, is eliminated. The rest of the values are calculated: the minimum (C^i_L), geometric mean (C_M^i), and maximum (C_u^i) of the remaining conservative value; and the minimum (O_L^i), geometric mean (O_L^i), and maximum (O_U^i) of remaining optimistic value.

Step 3: Determine if the TFNs of the most conservative and optimistic value are $c^i=(c^i_L, c^i_M, c^i_U)$ and $o^i=(o^i_L, o^i_M, o^i_U)$ for each item.

Step 4: Inspect whether the expert opinions are consistent or not and calculate the consensus significance value (G_i) for each item.

(1) If the paired TFNs do not overlap(i.e., $C^i_U \le O_L^i$) then there is a consensus in item i. The consensus significance value is calculated as follows:

$$G^i = \frac{C^i_M - O^i_M}{2} \qquad (1)$$

(2) If the paired TFNs overlap(i.e., $C^i_U > O_L^i$), and the gray zone interval value ($Z^i= C^i_U - O_L^i$) is less than the interval value of C^i and O^i ($M^i= O_L^i - C^i_U$), then the consensus significance value of each item is calculated as follows:

$$G^i = \frac{[(C^i_U * O^i_M) - (O^i_L * C^i_M)]}{[(C^i_U - C^i_M) + (O^i_M - O^i_L)]} \qquad (2)$$

If the paired TFNs overlap (i.e. , $C^i_U > O^i_L$), and thr gray zone interval value ($Z^i= C^i_U - O_L^i$) is more than the interval value of C^i and O^i ($M^i= O_L^i - C^i_U$), then there are discrepancies in the expert opinions. Repeat steps 1-4 until each item is converged and G^i is calculated.
These steps are seen in figure 2.

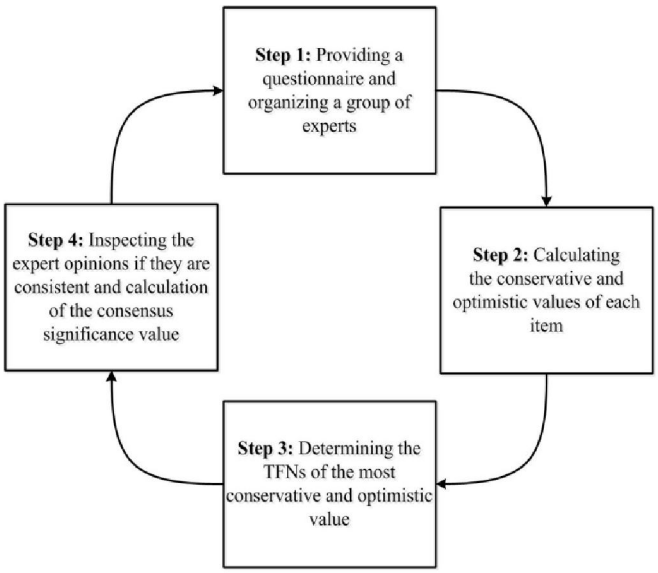

Figure2. Fuzzy Delphi in a step by step approach

2.3 Fuzzy Linguistic Theory

Fuzzy set theory was introduced to enable uncertain and imprecise real world systems to be captured via linguistics variables [19]. Fuzzy logic thus is a useful tool for dealing with decisions involving complex, ambiguous, and vague phenomena based on the meanings of the linguistic variables. Traditional quantitative methods are problematic when analysis complicated and ill-defined. The study by point out the solution was the fuzzy linguistic method [19]. Linguistics expression provides a useful approach for interpreting the semantics of vague based on the subjective judgments of evaluators. Linguistic variables are variables which do not bear numerical values but are words or sentences in a natural or artificial language. The concept of linguistic variables has been developed as a counterpart of the concept of a numerical variable.

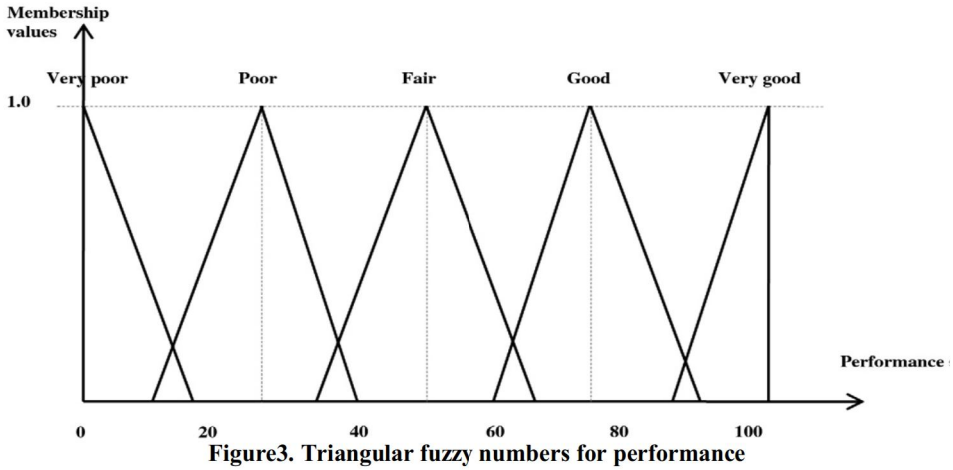

Figure3. Triangular fuzzy numbers for performance

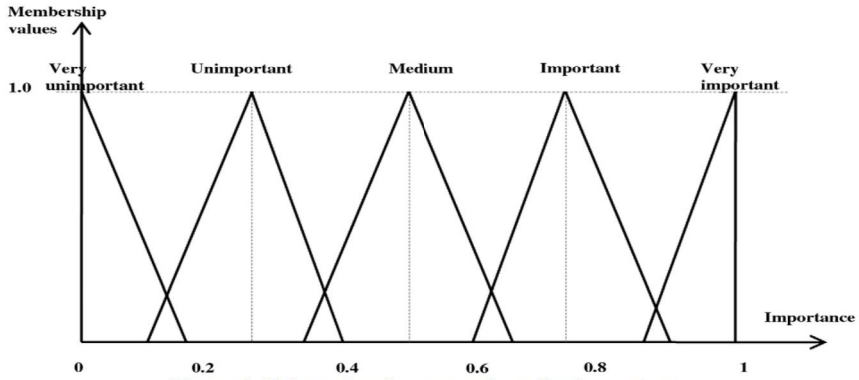

Figure4. Triangular fuzzy numbers for importance

Fuzzy theory constructs a conceptual framework for a systematic treatment of fuzziness in linguistic variables that are represented in words or sentences. These linguistic variables are

interpreted as fuzzy sets characterized by membership functions. A fuzzy set is a mapping of a set of real numbers ( ) onto membership values ( ) that lie in the range [0, 1]. Membership function can capture the human quantitative meaning of such variables so they can be processed as data. To capture the true human meaning of words or sentences, constructing their membership functions is important for the success of fuzzy applications. The objective of a fuzzy linguistic is to solve complicated, subjective and undefined situations. The fuzzy linguistic variables are adopted to be triangular fuzzy numbers which are classified to symmetry. Linguistic variables are triangular fuzzy numbers, no matter whether they are symmetric, and have similar estimated results. It is of no difference whether using symmetric or asymmetric triangular fuzzy number in research [20]. The linguistic scale given in Fig.3 is used for the evaluation since people use usually linguistic terms to define their logical judgments [21]. Fig.3 shows triangular fuzzy numbers for the intangible linguistic scale where linguistic terms are defined as Very Poor (VP); Poor (P); Fair (F); Good (G); Very Good (VG). The corresponding fuzzy numbers of the five linguistic scale are (0, 0, 15), (10,25,40), (35,50,65), (60,75,90), (85,100,100).To weight the importance of each criterion, it is adopted with a five-scale fuzzy linguistic: absolutely unimportant (AU), unimportant(U), moderately important (MI), important (I), and very important (VI) (Fig.4), where

the corresponding fuzzy numbers are (0, 0, 0.15), (0.1, 0.25, 0.4), (0.35, 0.5, 0.65), (0.6, 0.75, 0.9),(0.85, 1, 1), respectively.

Let P_{ij}^m be the performance value evaluated by expert m for perspective i and criterion j, and the membership function of triangular fuzzy number $P_{ij}^m \in T$. Let W_{ij}^m be the weight of importance evaluated by respondent m for perspective i and criterion j, and the membership function of triangular fuzzy number $W_{ij}^m \in S$.

$$P_{ij}^m = (LP_{ij}^m, MP_{ij}^m, UP_{ij}^m), P_{ij}^m \in T, Where \quad (3)$$

$$0 \le LP_{ij}^m \le MP_{ij}^m \le UP_{ij}^m \le 100$$

$$W_{ij}^m = (LW_{ij}^m, MW_{ij}^m, UW_{ij}^m), W_{ij}^m \in S, Where \quad (4)$$

$$0 \le LW_{ij}^m \le MW_{ij}^m \le MW_{ij}^m \le 1$$

The Equations (5) and (6) are used to aggregate the expert opinions of performance value and importance

$$P_{ij} = P_{ij}^1 * W_{e1} + P_{ij}^2 * W_{e2} + \ldots + P_{ij}^m * W_{em} \quad (5)$$

$$W_{ij} = W_{ij}^1 * W_{e1} + W_{ij}^2 * W_{e2} + \ldots + W_{ij}^m * W_{em} \quad (6)$$

Where P_{ij}, W_{ij}, W_{em} and m are performance value of expert opinion for perspective i and criterion j, importance evaluated by expert for perspective i and criterion j, expert weight and number of expert in performance evaluation group, respectively. This study adopts BSC with fuzzy linguistic to evaluate team sports performance. Since the output of the fuzzy system is a fuzzy set, the defuzzification procedure is used to convert the fuzzy result into a numerical value to represent the performance of OR. Mean-of-maximum (MOM) defuzzification and center-of-area (COA) defuzzification are popular methods that convert a fuzzy set to non-fuzzy value. These two defuzzification methods were compared and concluded that COA yields better results than MOM [22,23] . The COA is a simple and practical method of calculating BNP value [20] .Equations (7) and (8) show the BNP values of fuzzy performance and fuzzy weight, respectively.

$$BNP_i^p = \frac{[(UP_i - LP_i) + (MP_i - LP_i)]}{3} + LP_i, \forall i \quad (7)$$

$$BNP_i^w = \frac{[(UM_i - LW_i) + (MW_i - LW_i)]}{3} + LW_i, \forall i \quad (8)$$

Finally, the PS is calculated with BNP_i^p and BNP_i^w .PS is the performance score of team sports

$$PS = \frac{\sum BNP_i^w * BNP_i^p}{n} \quad (9)$$

which n is the number of criteria.

3. METHODOLOGY

Step 1: recognizing measures of performance through expert questionnaires and fuzzy Delphi Method.

Step 2: forming the structure of BSC using the results of step 1.

Step 3: forming a committee of decision makers for designing the fuzzy linguistic scales. To face up the ambiguities of human assessments, the linguistic variables 'performance' and 'importance' is used with five linguistic terms as shown in figure1 & figure2.

Step 4: using an algorithm based on fuzzy linguistic approach for evaluating performance.

The methodology is depicted in figure 5.

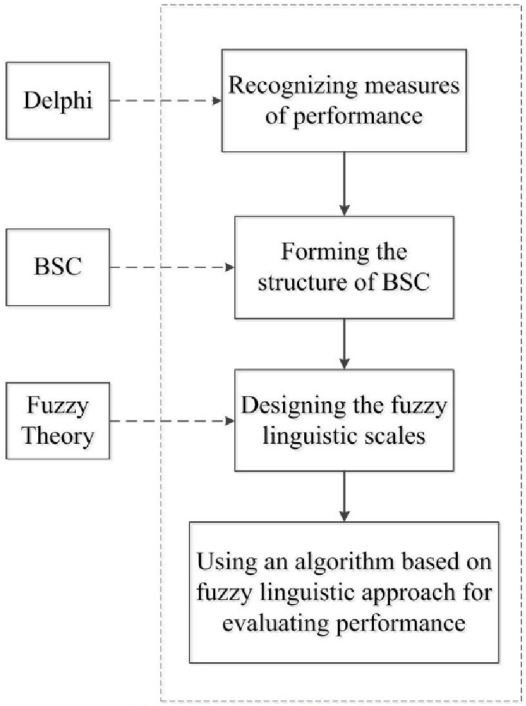

Figure5. The methodology

4. CASE STUDY

4.1 SANAT NAFT NOVIN Abadan Football Club

SANAT NAFT NOVIN Abadan Football Club is an Iranian football club based in Abadan, Iran. They currently compete in the 2011–12 Iran Football's 2nd Division, Iranian football's 2nd division is the third-highest football division overall in the Iranian football league system. Before 2001, the 2nd division league was the second-highest division in Iranian football league. However, this was changed to third-highest division when Iran's football structure officially became professional. Prior to the establishment of the "Takhte Jamshid" League in 1972, the people of Abadan mostly followed two clubs, "Kargar" FC and Jam FC. "Kargar" had been established by workers from Abadan's oil refinery. When the "Takhte Jamshid" League was established, the city of Abadan was given one spot. The club was to be managed by Iran's oil industry. Fans were immediately drawn to the team, as it would be competing in Iran's top football league. The club's original kit colors were white, blue and black. The city of Abadan and the Khuzestan Province had very technical players and the club adapted a

style of play similar to the Brazil of the 1970s after "Parviz Dehdari" became the chairman of the club. To emphasize their admiration for Brazilian football, the club changed its team colors to yellow, blue and white, exactly like the Brazilian national team. The clubs nickname, Iran's Brazil, soon appeared. Since many natives of Abadan had left the city during the war for other cities, fan support for the club was always good no matter where the team was playing. After the war the club went back to Abadan, but due to the war's negative effects on the city and poor management in the football club, SANAT NAFT has not been able to have any major success.

4.2 SANAT NAFT NOVIN Abadan Football Club

Following the review of literatures and multidisciplinary experts (Clubs managers, Athletics), and according to the four perspectives of BSC e.g. financial perspective, internal processes perspective, learning and growth perspective and customer perspective, we got the performance indicators system for team sports. Twenty five indicators were finally selected and organized by expert panel into the four BSC, depicted in Table 2.

Table1. Results of calculation of measures of BSC with FDM

Measures	Pessimistic value		Optimistic value		Geometric mean		M^i-Z^i	Consensus value
	C_L^i	C_U^i	O_L^i	O_U^i	C_M^i	O_M^i		
Learning and growth perspective								
Capabilities to apply information systems	1	8	7	10	4.94	8.43	2.49	7.32>6.5
Coaches training and knowledge management	1	7	7	10	4.62	8.30	3.68	7>6.5
Staff satisfaction	1	8	7	10	4.02	8.65	3.56	7.30>6.5
Internal communication	4	8	7	10	6.19	8.65	1.46	7.48>6.5
Employ and retain competent athletics	3	8	7	10	5.21	8.38	2.17	7.33>6.5
Team work	1	8	7	10	4.71	8.93	3.22	7.37>6.5
Number of training coaches	1	8	6	10	4.26	8.43	2.17	6.79>6.5
Internal processes perspective								
Selection criteria	1	9	6	10	4.65	8.50	0.86	7.10>6.5
Talent management	4	8	6	10	5.77	8.24	0.47	7>6.5
Response of discovering mistakes	4	9	8	10	6.53	9.26	1.73	8.34>6.5
Effective information systems	4	8	6	10	5.77	8.24	0.47	7>6.5
Ability of coordination	1	8	6	10	4.23	7.99	1.76	6.69<6.5
Regulation management capability	2	8	5	10	3.87	6.93	0.05	5.95<6.5
Customer perspective								
Fans satisfaction about competitions	1	8	7	10	4.60	8.80	3.19	7.35>6.5
Good performance by a team	5	9	8	10	6.74	9.09	1.35	8.33>6.5
Good quality matches	4	7	7	9	5.77	7.98	2.22	7>6.5
Suitable ticket prices	4	7	6	10	5.49	7.90	1.42	6.56>6.5
Quality of service	1	8	5	10	4.62	7.94	0.33	6.4<6.5
Team image	2	5	4	9	3.36	6.23	1.87	4.58<6.5
Club loyalty	2	6	5	9	3.60	6.70	2.11	5.41<6.5
Merchandise	4	8	6	10	6.45	8.74	0.29	7.28>6.5
VIP section service	4	7	7	10	5.62	8.08	2.47	7>6.5
Management of sponsors	4	7	6	10	5.49	7.90	1.42	6.56>6.5
Number of fans, match attendance	4	7	7	9	5.77	7.98	2.22	7>6.5
Valuable and effective advertising space	1	8	7	10	4.60	8.80	3.19	7.35>6.5
Media presence	3	7	7	9	5.33	8.21	2.87	7>6.5
Financial perspective								
Income from sponsors	1	8	7	10	4.94	8.43	2.49	7.32>6.5
Income from athletics transformation	1	8	7	10	4.09	8.65	3.56	7.30>6.5
Payments of parents	1	6	5	10	3.65	7.13	2.48	6.5>5.48
Government subsidies	1	7	7	10	4.62	8.30	3.68	7>6.5

4.3 Performance Score of Team Sports

Define abbreviations and acronyms the first time they are used in the text, even after they have already been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, ac, dc, and rms do not have to be defined. Abbreviations that incorporate periods should not have spaces: write "C.N.R.S.," not "C. N. R. S.". Do not use abbreviations in the title unless they are unavoidable.

Table2. Measures of BSC

Perspective	Measures
Learning and growth perspective	Capabilities to apply information systems
	Coaches training and knowledge management
	Staff satisfaction
	Internal communication
	Employ and retain competent athletics
	Team work
	Number of training coaches
Internal processes perspective	Selection criteria
	Talent management
	Response of discovering mistakes
	Effective information systems
	Ability of coordination
Customer perspective	Fans satisfaction about competitions
	Good performance by a team
	Good quality matches
	Suitable ticket prices
	Merchandise
	Vip section service
	Management of sponsors
	Number of fans, match attendance
	Valuable and effective advertising space
	Media presence
Financial perspective	Income from sponsors
	Income from athletics transformation
	Government subsidies

Table 3.The Weight of each expert

Experts	A	B	C	D	E	F	G
Weight	0.15	0.18	0.09	0.12	0.16	0.19	0.11

Table 4.The performance values

Criterion		Expert A	Expert B	Expert C	Expert D	Expert E	Expert F	Expert G
1	Capabilities to apply information systems	G	VG	F	G	G	F	G
2	Coaches training and knowledge management	G	G	G	VG	G	G	VG
3	Staff satisfaction	F	G	F	G	G	F	G
4	Internal communication	F	F	F	F	F	F	F
5	Employ and retain competent athletics	G	F	G	G	G	F	F
6	Team work	F	P	F	F	F	P	F
7	Number of training coaches	G	F	G	G	G	G	G
8	Selection criteria	F	F	G	G	F	F	F
9	Talent management	P	F	F	F	P	F	F
10	Response of discovering mistakes	F	F	F	P	P	F	F
11	Effective information systems	F	F	G	F	F	F	F
12	Ability of coordination	F	F	F	P	P	P	P
13	Fans satisfaction about competitions	F	F	F	F	F	F	F
14	Good performance by a team	F	F	F	F	G	P	F
15	Good quality matches	F	F	F	F	F	F	F

Criterion		Expert A	Expert B	Expert C	Expert D	Expert E	Expert F	Expert G
16	Suitable ticket prices	G	G	G	VG	G	VG	G
17	Merchandise	G	G	G	G	G	G	F
18	Vip section service	G	G	G	G	G	G	G
19	Management of sponsors	VG	G	VG	G	G	G	VG
20	Number of fans, match attendance	F	F	P	P	P	P	P
21	Valuable and effective advertising space	G	G	G	G	G	G	G
22	Media presence	G	G	F	F	G	G	G
23	Income from sponsors	VG	VG	VG	VG	VG	G	VG
24	Income from athletics transformation	F	F	F	F	P	P	P
25	Government subsidies	VG	G	VG	VG	VG	VG	G

Table 5.Weight of importance

Criterion		Expert A	Expert B	Expert C	Expert D	Expert E	Expert F	Expert G
1	Capabilities to apply information systems	I	VI	I	I	I	VI	I
2	Coaches training and knowledge management	I	I	I	I	I	I	I
3	Staff satisfaction	VI	VI	I	I	I	VI	VI
4	Internal communication	I	VI	I	I	I	I	VI
5	Employ and retain competent athletics	VI	VI	VI	VI	VI	VI	VI
6	Team work	VI	VI	VI	VI	VI	VI	VI
7	Number of training coaches	VI	VI	VI	VI	VI	VI	VI
8	Selection criteria	I	I	I	VI	I	I	VI
9	Talent management	VI	VI	VI	VI	VI	VI	VI
10	Response of discovering mistakes	I	I	I	VI	I	I	I
11	Effective information systems	I	I	I	VI	I	I	I
12	Ability of coordination	VI	VI	VI	VI	I	I	VI
13	Fans satisfaction about competitions	VI	VI	VI	VI	VI	VI	VI
14	Good performance by a team	VI	VI	VI	VI	VI	VI	VI
15	Good quality matches	I	I	I	I	I	I	I
16	Suitable ticket prices	M	M	M	M	I	I	M
17	Merchandise	I	I	I	VI	I	I	M
18	Vip section service	M	M	M	M	M	M	I
19	Management of sponsors	VI	VI	VI	VI	VI	VI	VI
20	Number of fans, match attendance	VI	VI	VI	VI	VI	VI	VI
21	Valuable and effective advertising space	I	I	I	I	VI	VI	I
22	Media presence	I	I	I	I	I	I	I
23	Income from sponsors	VI	VI	VI	VI	VI	VI	VI
24	Income from athletics transformation	VI	I	I	I	M	I	M
25	Government subsidies	I	I	VI	VI	VI	I	I

Table 6.Performance score of each criteria

	Criterion	Performance score
1	Capabilities to apply information systems	58.9984
2	Coaches training and knowledge management	59.7
3	Staff satisfaction	56.283
4	Internal communication	40.4
5	Employ and retain competent athletics	59.85
6	Team work	38.7125
7	Number of training coaches	66.975
8	Selection criteria	43.979
9	Talent management	40.1375
10	Response of discovering mistakes	33.282
11	Effective information systems	40.4415
12	Ability of coordination	31.24

	Criterion	Performance score
13	Fans satisfaction about competitions	47.5
14	Good performance by a team	46.7875
15	Good quality matches	37.5
16	Suitable ticket prices	47.705
17	Merchandise	53.93463
18	VIP section service	39.5625
19	Management of sponsors	77.9
20	Number of fans, match attendance	31.5875
21	Valuable and effective advertising space	61.5
22	Media presence	52.3125
23	Income from sponsors	86.64
24	Income from athletics transformation	29.337
25	Government subsidies	73.5008
	Performance score of team sports	50.23065

5. CONCLUSION AND DISCUSSION

Balanced scorecard is a tool for translating strategy into action via various sets of performance measurement indicators. Numerous studies and literatures have devised procedures for evaluating performance measurements. The Balanced Scorecard model is suitable for sport businesses because it is capable for presenting not only the financial processes but also the elements of vision and strategy so crucial in sports. With the designation of a target value connected to non-financial perspectives, the customer, learning and growth, and internal structural perspectives can also become quantifiable and through the assigned indicators the development tendency can be measured and controlled. So this study used BSC theory to build a performance indicators system depending on expert consensus opinions from experts working and playing in clubs and associations. Furthermore, this study also proposed fuzzy linguistic integrating with BSC to evaluate team sports performance. An important advantage of the fuzzy linguistic method is that the performance indicators can be clearly identified and expressed quantitatively. For this aim new performance evaluation method has been developed in this paper. Compared with the traditional performance evaluation, the proposed hierarchical balanced scorecard with Fuzzy linguistic has the following advantages:

- The performance indicators system and performance values are proposed by team managers, and Athletics with a comprehensive view and overcomes the decision makers' subjective consciousness.
- The hierarchical BSC performance evaluation system can establish a communication system that bridges the gap between goals established by high-level managers and the staff whose performances is ultimately responsible for achieving organizational goals.
- The performance indicators values and the weight of importance are evaluated in a fuzzy linguistic rather than in precise numerical values. This enables the experts to express their judgments more realistically and makes the assessment easier to be carried out.
- The proposed method can be used by public sectors for self-assessment which evaluation data is unavailable or unreliable, as it does not force precision.

For the future study, following topics can be handled: (i) the performance value and weight of importance can be obtained through involving more participants from different expertise knowledge; (ii) to generalize the results to different team sports and other club sectors.

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