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Development of an assessing grid of organizational performance in the associative network of african athletics

Elaboration d'une grille d'évaluation de la performance organisationnelle dans le réseau associatif de l'athlétisme africain

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Abstract: This article develops an assessing grid to evaluate organizational performance within the associative network of African athletics. Factorial analysis into principal components helped to identify local builds of performance of federations, regional associations, training and forming centres. A heap of these local builds of performance includes 3 levels and 5 axes of performance. A measurement system that builds on the performance of entities developed by the EOCGRAI method was materialised in the assessing grid. The metrological validity (construct, content, criterion and fidelity), managerial (help for assessment and decision-making) and a field of perspective (accessibility) were tested on a sample of 25 activity reports produced by five regional associations from 2009 to 2013. Analysis shows that the items of the assessing grid are homogeneous ($0,5 \leq \alpha_{(Cronbach)} \leq 0,916$). The results of the ratings criterion of activities and the scores are both coincident ($R_{(Spearman)} = 0,90$; $p = 0,037$) positively and significantly correlated ($r_{(Pearson)} = 0,92$; $p = 0,026$) and equivalents (60% level of agreement). Successful entities suspected on the basis of the criterion ratings have higher scores (ANOVA $_{(current\ effect)}$: $F(4, 16) = 18.516$, $p = 0.00001$, with a 95% confidence interval). The developed assessing grid helps to quantify, to represent the activity of a network entity and to complete the internal structure of existing activity reports. It therefore has a good potential of validity, fidelity and accessibility. It constitutes thus, a tangible support and objective evaluation, and so its usefulness and relevance for the management of organizational performance in this network.

Keywords: Organizational performance, Assessment grid, validity, fidelity, accessibility, African athletics

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1. Introduction

Find ways to assess organizational performance is an every moment concern of the associative network of African athletics. It is in this context that an assessment grid was developed to help to measure, to monitor and estimate the integral activity of institutional entities in this network. The developed assessment grid is then supposed to provide objective data other than conventional statistics from competition results in order to daily inform, the decisions of the leaders at the top of the network. This is a reason why this assessment grid cannot be exempted from the qualities expected of a measurement tool at all stages of its life cycle.

In the metrological field, several studies tend to show that measuring the quality of a measurement tool is through validity and fidelity means (Fortin, 1994). But from the perspective of field, accessibility of the measuring tool to the actors for whom it is intended is highly needed (Nadeu, 2001; Richard, 1998). From a manager standpoint, usefulness and relevance of a management tool is evaluated by its contribution's channel to appreciate the success or even the failure of an organization and especially its contribution to the decision taken by the leaders (Winand et al., 2010). Generally, if the validity is a concept that refers to the fact that a measurement procedure should first and foremost, effectively measure the characteristics it supposed to evaluate, several authors agree to perceive the validity as a complex and long-term process, which at the same time includes the building of an assessment tool and the gathering over time, the evidences of its usefulness and its relevance in a given context (Anastasi, 1990).

This study aims to present not only the building up of an assessing grid of organizational performance in the associative network of African athletics, but to especially show the pilot study of validation undertaken to collect evidences of the usefulness and relevance of this assessment grid in the context of this network. The article follow with: (2) a review of the concepts related to the measure of the quality of an assessment tool, (3) the methodology, results, and discussion and finally, (4) the conclusion.

2. Review of the concepts related to the measure of the quality of an assessment tool

2.1 Validity

Generally it is accepted that an assessment grid is convincing if it sustains three categories of evidence: construct validity, content validity and criterion validity includes concurrent validity and predictive validity (Borteyrou and al., 2006). Construct validity examines the apprehended builds of a tool (Cronbach, 1984), and it is actually reduce to forefront analyze, by convergence or differentiation, the meaning of the scores associated with the concept measured. The facade of validity relies then on expert judgment to found the degree of concordance between the items of a tool and the construct evaluated. The validity by convergence is rather to apply different measurement scales developed theoretically similar built on the same concept, and to analyze correlations on those measures which are expected to provide similar results. Finally, the validity by differentiation means applying measurement scales developed on products theoretically opposed, but connected to the same concept and subsequently appreciate the ability of the tool to differentiate the measured constructed with other construct that are similar (Fortin, 1994). Practically, construct validity is usually tested through multi-feature multi-method traits on one hand and factor analysis on the other (Borteyrou et al., 2006).

Content validity questions the representativeness of the characteristic to be measured by different aspects of a tool (Laveault & Gregoire, 1997). In order to match concordance of a tool content with the level of understanding by actors of the feature size up, ones proceed either by the nominal validity or consensus validity. The nominal validity is the use of an expert to assess whether the items of a tool

are extensive and representative of the concept to measure. Consensus validity refers to the consent of a panel of experts to assess the extent and representativeness of the concept by the items of a tool (Lynn, 1986; Thomas, 1992). Specifically, validity of content can be estimated using Cronbach Alpha test (Borteyrou and al., 2006).

Criterion validity is proved by the relation degree between a measurement tool with another independent one capable to assess the same phenomenon. In fact, it is to determine the degree of correlation between the performance of a tool with an external criterion used in the second measure to evaluate the same concept. Two subcategories of criterion validity emerge: the concomitant or concurrent validity and predictive validity. Concurrent validity is at a joint application, the degree of correlation between an external criterion and the performance of a tool. Predictive validity is illustrated by the degree of correlation between the past performance of a tool and the external criterion applied later. In short, the validity criterion is based on a premise that the subjects with a high score to a test, tend to perform better on the external criterion than those who obtain lower scores on this test (Fortin, 1994).

2.2 Fidelity

Loyalty or reliability refers to the degree of consistency and accuracy with which a tool measures a phenomenon. Three techniques are used to prove the fidelity of a tool: stability, internal consistency and equivalence (Fortin, 1994). The stability is based on a statement that: the factor to be size-up remains constant over a measurement time (Lynn, 1986). This refers to the regularity in the responses when a measurement tool is applied repeatedly. The degree of repeatability scores over time can then be evaluated by the technique of test-retest, called test-retest reliability. In the presence of sets of scores, stability is assessed by a correlation coefficient of Pearson. If the nominal or ordinal data result from the sets of scores, then a correlation coefficient rank of Spearman is indicated. However, a high correlation coefficient indicates that data has not changed between the test and the retest (Thomas, 1992).

Internal consistency indicates how the items of a tool are related to the extent of the same dimension. For a multidimensional tool, internal consistency is estimated for each of the sub-concepts of its dimensions. The techniques used vary with the scales of measurement performed to determine scores. For multiple choice scales, an Alpha test of Cronbach is recommended (Cronbach, 1951). Concerning the dichotomous scales, a Kuder-Richardson calculation of coefficient is indicated. In addition, the total inter-item correlations and half and half reliability can respectively be used to demonstrate the link between individual items and the total score on one hand and check if the scores of the two halves of items have a high correlation on the other hand.

Equivalence represents the degree of similarity between two parallel versions of the forms of a measuring tool or the degree of similarity between several observers measuring the same characteristic. Equivalence is then estimated through a level of agreement (%) calculated by dividing the number of agreements to the total sum of agreements and disagreements (Brunelle and al., 1996; Piéron 1993; Siedentop1994).

2.3 Accessibility

When a measurement tool faced then realities of field, the feasibility of the measure is expected to provide, depends frequently of its accessibility. In other words, the possibility that this measuring tool is not only accessible for users, but which is easy to use both in its application than in data processing; allowing to meet the objectives and also the standards of validity and reliability (Nadeu, 2001 Siedentop, 1994).

3. Methodology, results and discussion

3.1 Methodology

3.1.1 Participants

Subjects (30) were chosen based on the number of years invested in athletics and the position. Their average number of years in the service of African athletics was 16.63 ± 6.89 years and 7.36 ± 4.75 years at the occupied position. 5 (1 Secretary General and four directors) participated in the first stage, 15 (2 general secretaries, 4 directors, one accountant, 3 high-level coaches and 5 technical officials resource persons from regions) in the second stage and 10 (3 responsible for training and education centres, 5 contacts and 2 regional directors of two High Performance Training Centre) in the third one. Among the 30 participants, 3 directors participated more in the fourth stage and 4 (1 Director of CAA headquarters, 2 directors of high level training centres and 1 national technical director of athletics federation) served as experts in fifth stage.

3.1.2 Proceedings

- ***Construction of the evaluation grid***

A constructivist-subjectivist kind of methodology (Bayle, 2000) was selected and the approach was to seek network strategy, declination and monitoring of this strategy and finally the appreciation of results (Berland (2009). The implemented phases appear as follows:

- Phase 1: diagnosis of network operations to determine its purpose and its major strategy on African continent;
- Phase 2: exploratory and explanatory analysis of opinions and representations of organizational performance in the network to identify and record existing assessment criteria;
- Phase 3: structuring current assessing criteria in order to build a model of performance of a network entity;
- Phase 4: development and embodiment of valuation system in a physical medium calculation to quantify organizational performance in the network;
- Phase 5: submit the validity of the assessment tool developed to a test.

The construct of organizational performance embodied in the developed assessing grid is an aggregate of local constructs of performance previously identified by factor's analysis of main components on federations, regional associations and the administrators and athletes training centres. The corresponding measurement system includes, in addition to the 3 aspects and 5 built axes of performance, 15 items declined from decisional variables and 20 measurement indicators. The organizational aspect is thus evaluated following 1-axis of performance, 3 items and 4 indicators. The sports aspect is evaluated through 3 axes of performance, 9 items (3 per axis) and 12 indicators (4 per axis). Finally, the promotional dimension is valued by one axis performance, 3 items and 4 indicators.

- ***Determination of criteria used in second measure***

The performance of an organization is linked to the activities implemented and the way they are articulated (Lorino, 1991). The exploration of representations of organizational performance (Step 2) revealed a host of activities to evaluate a network entity. On107 assessment criteria listed (Step 2), 39 (36%) are used to assess associations, 40 (37%) training centres and training and 28 (27%) regional associations. According to the architecture of the performance of an Olympic sports organization (Bayle, 2000), these criteria are from sport nature (30 or 28%), organizational (21 or 20%), social

internal (16 or 15%), promotional (15 or 14%), economic and financial (13 or 13%) and societal (11 or 10%). These criteria are related to activities planned, conducted and reported by network entities. The criterion of performance of activities was thus selected as second measure.

- ***Measurements provided by an assessing grid***

A bipolar semantic scale from 1 to 4 is used to mark the indicators. The target value (4) is assigned to previsions fully realized, the intermediate value (3) is assigned to previsions partly realized, the intermediate value (2) is used to prevision partially completed and the minimum value (1) is granted to previsions not realized. The scores obtained on three levels of performance are calculated by the following formula (The Agree Collaboration, 2002) before being joined into an overall score of performance of an entity.

Score obtained on a level – Minimum possible score

---------- = % (maximum score possible)

Maximum possible score - Minimum possible score

In this formula, the score obtained on a level is the sum of ratings of the items of an assessing axis. The maximum possible score is the product of the target value (4) by the number of items of a size and the number of assessors. The minimum possible score is the minimum value of the product (1) of the quotation by the number of items of a level and the number of assessors. The average score obtained on an assessing axis is calculated and converted to entire value (Arcioni and Bayle, 2009), as follows:

Sum of scores on an axle

---------- = Score average on this axle

Sum of items for this axle

For an average score (x1),$1 \leqslant x1 < 1.75 = 1$; $1.75 \leqslant x1 < 2.5 = 2$; $2.5 \leqslant x1 < 3.25 = 3$ and $x1 \geqslant 3, 25 = 4$. The whole values of averages scores per assessing axle are shown in a radar chart with five branches representing the 5 assessing axes (The Agree Collaboration, 2002; Arcioni and Bayle, 2009). On the same chart radar, an average theoretical expertise (Grade 2) serves as a base overlay of a recent empirical expertise. Thus, the areas of strength appear with the recent expertise when it completely covers the prior expert on a given assessing axis. When the previous expertise is visible on a given axis, it materializes weakness (The Agree Collaboration, 2002).

3.1.3. Collection and processing of data

Data were collected at CAA headquarters in the following chronological order: from the 1st to 7 April 2014 (Step 1), from 9 to 14 April 2014 (Step 2), from 20 April to 30 July 2014 (Step 3), from August 4 to 9, 2014 (Step 4) and finally, the experts were interviewed on April 16, 2014 and the activity reports observed from 10 to 30 September, 2014 (Step 5). In interviews, triangulation procedure (Miles & Huberman, 1991) was run. Thereafter, content analysis (Bardin, 1995) was conducted and the assessing criteria were categorized according to the performance size of an Olympic sports organization (Bayle, 2000).

Factorial analysis into principal components (ACP) aimed the ratings of dimensions and criteria weighted by the numbers of years of serving athletics and the position (Step 3). The weighting weight for the subjects of hopes training centres are 12.44%, 8% and 6.22%, for the participant of high-level training centres 19.56%, for the investigated subject of Development regional centres 3.56% and for investigated subjects of regional associations 9.78% (R1CAA), 14.22% (R2CAA), 12% (R3CAA), 6.22% (R4CAA) and 8% (R5CAA). Concerning the aspects and criteria identically notified, only one of these aspects and criteria is used for the factorization. When the dimensions and the criteria taken into account in the calculation are carrying the variability of performance, size and other criteria which

they were mathematically related are taken into account in building performance. The oblique rotation of axes was performed by the Varimax method, the reliability of the scale was validated by Cronbach's alpha greater than 0.5 (Cronbach, 1951 Wuensch, 2001). The minimum sill of restitution of the variance was set at 70% and the rule: the pure value of the factor must be greater than 1 (Kaiser, 1958), was observed.

Indicators system of performance was developed and integrated into the construct of performance to produce a measurement system (Step 4). Analysis of validity of the developed assessing grid focused on the correlation (Spearman and Pearson), the calculation of a level agreement between the rows, the categorization of two groups of regional associations for an analysis of variance and a T-test of Student and the implementation of a Cronbach Alpha (Step 5). SPSS Version 10.0.05 software was used to perform analyzes and statistical tests at the same significance level ($\alpha = 0.05$).

3.2 Results

3.2.1 Construct on the performance of a network entity

Table 1. Architecture of organizational performance of a network entity.

Dimensions	Performance Axes
Organizational	Operation of the Headquarters
Sport	Elaboration of strategic development plan
	Organization of competition
	Securing the coaching
Promotional	Quality / Attractiveness of competitions

The construct of organizational performance of a network entity includes 3 dimensions and 5 axes of performance.

3.2.2 Validity of measurement system constructed contents of the performance

Table 2. Cronbach alpha test for internal consistency of the evaluation system.

Dimensions	Axes	Items	Alpha
Organizational	Operation Headquarters	Activity Services	0,919
		Focus on the governing leaders	
		Equipment Services	
Sportive	Strategic plan	Detection/Training	0,900
		Administrative - technical training	
		Participation in key activities	
	Organization of competitions	Respect of competitions cycles	0,786
		Respect of terms and conditions of the competitions	
		Involvement of qualified technical officials	
	Securing the frame	Support technical staff	0,785
		Administrative staff remuneration	
		Support for technical officials	
Promotional	Quality / attraction competitions	Participation of the best athletes	0,500
		Representative participation of members	
		Media coverage	

The Cronbach alpha crosses the 0.5 value reached 0.919 which is close to its target value 1.

3.2.3 Criterion validity of the evaluation grid

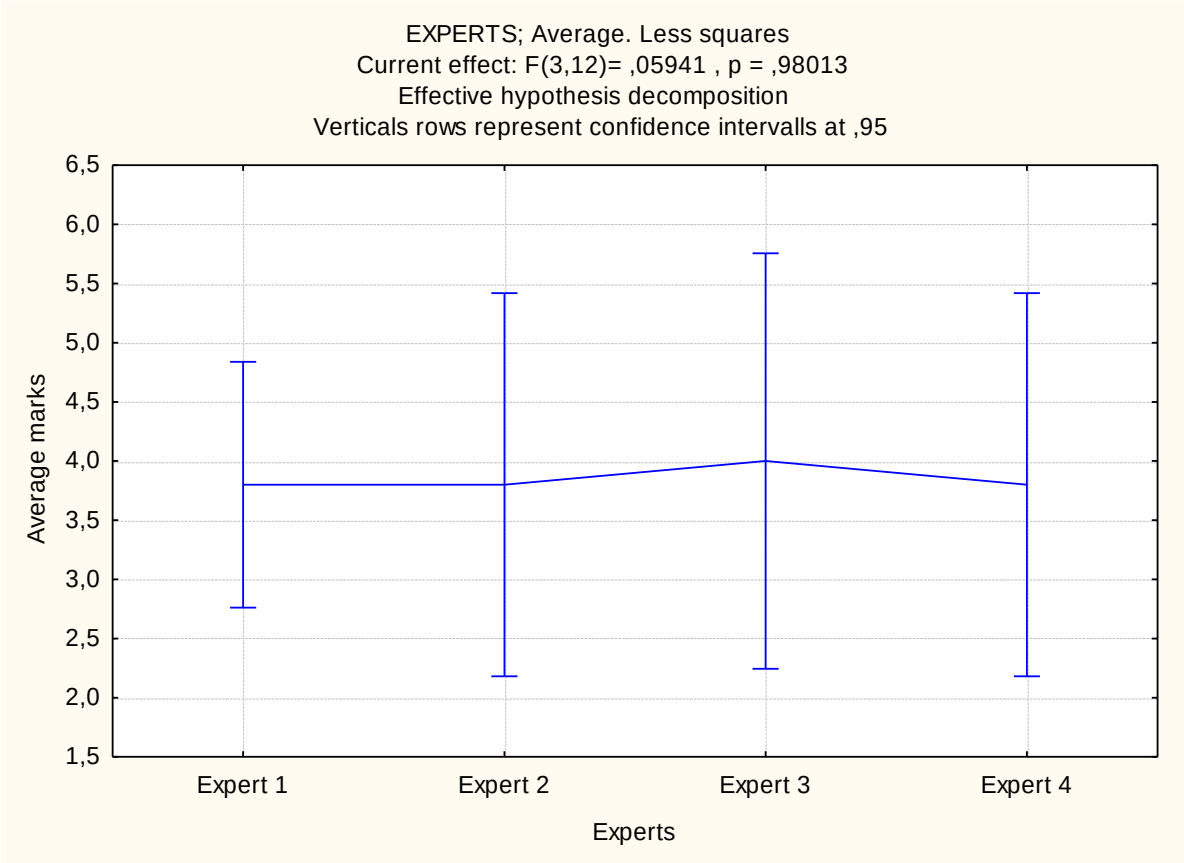

Figure 1. Appropriateness criteria used in second measure.

This ANOVA showed no difference of opinion of experts with regard to the criterion.

Table 3. Typology of entities.

Category	Rows	Regions	Marks of criterion
Performance	1	R2CAA	19
	2	R5CAA	17
	3	R4CAA	18
Inefficient	4	R1CAA	13
	5	R3CAA	10
Average ranking marks			**15,4 ± 3,78**

Regional associations categorized "successful" occupy rows 1, 2 and 3. Those categorized "underperforming" are classified at rank 4 and 5.

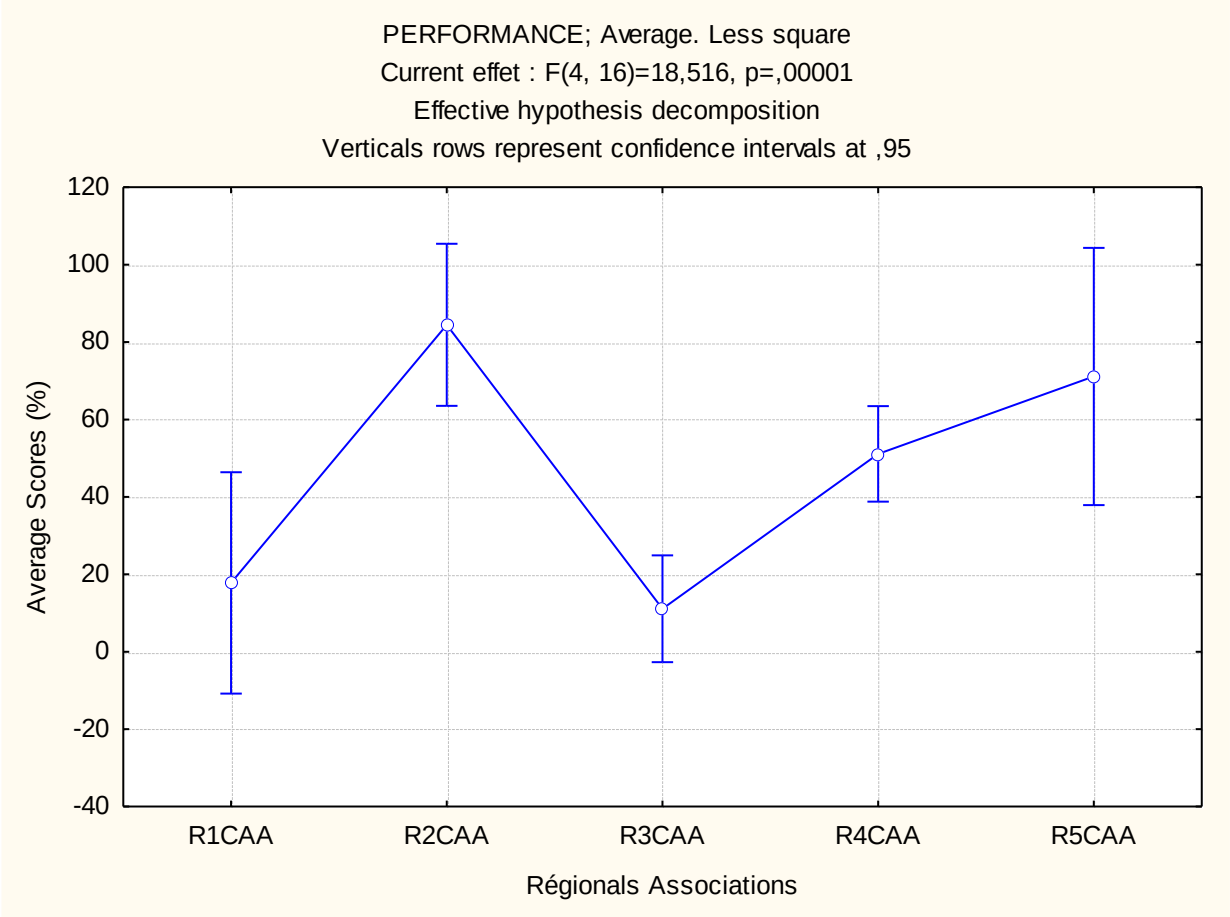

Figure 2. Comparison between typology groups.

The difference between average typology groups is significant (p = 0.00001).

Table 4. Correlation between ratings and scores.

	correlation coefficient of the rank of Spearman significant correlations labelled p < ,05000		
	r (x. y)	Spearman R	P
Marks vs Scores	0.920380	0,900000	0,037386

The correlation study above - shows that rows from the ratings of experts and those provided by the scores are significantly correlated (R = 0.9; p <0.05).

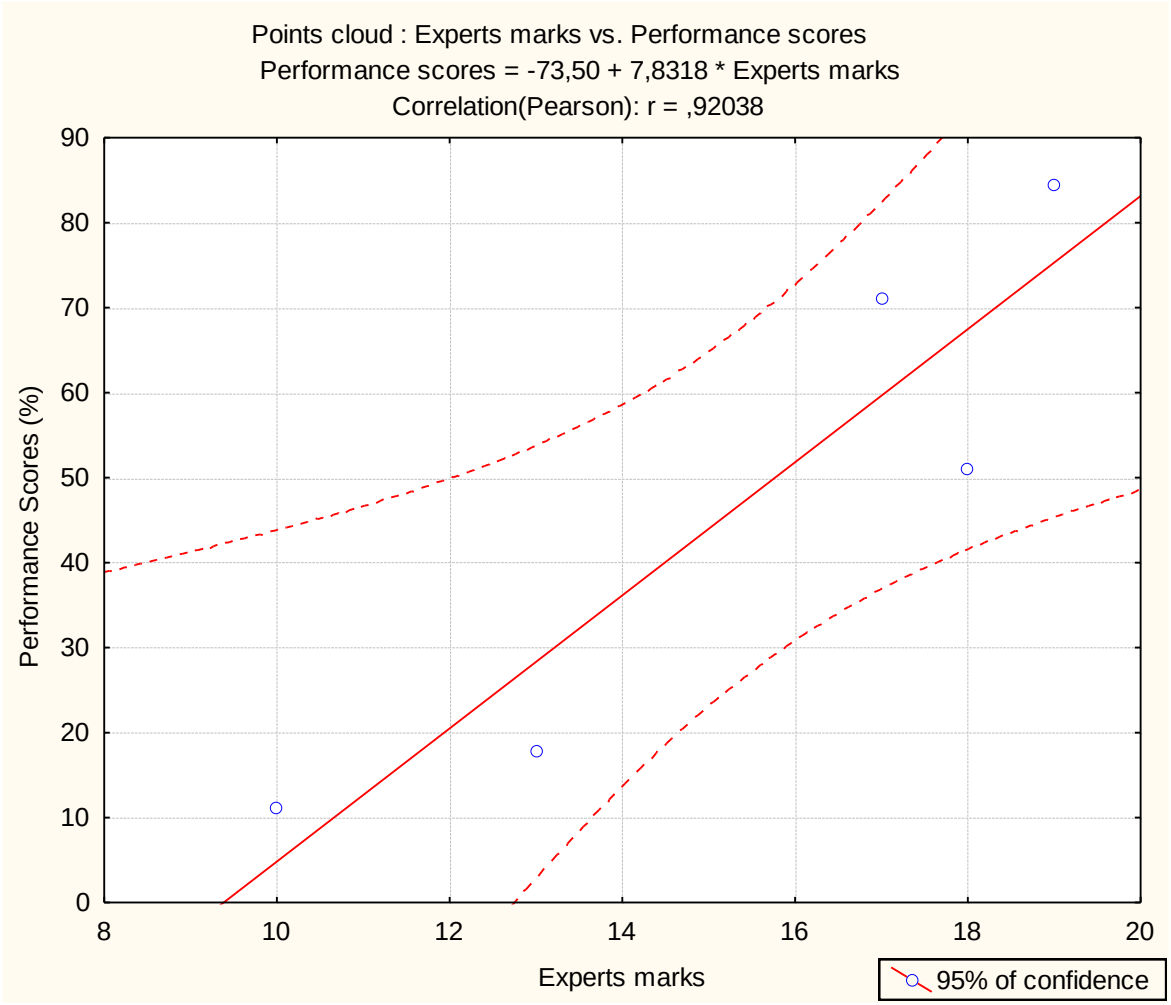

Figure 3. Linear fit between "scores" and "marks".

Marks and scores were linearly and positively correlated (r = 0.92).

3.2.4 Fidelity of the evaluation grid

Table 5. Equivalence between ratings and scores

Ranks of scores	Regions	Ranks of notes
1	R2CAA	1
2	R5CAA	3
3	R4CAA	2
4	R1CAA	4
5	R3CAA	5

On 5th row obtained, 3 rows (1, 4 and 5) agree, that is 60% level of agreement.

3.2.5 Managerial unit of the assessment grid

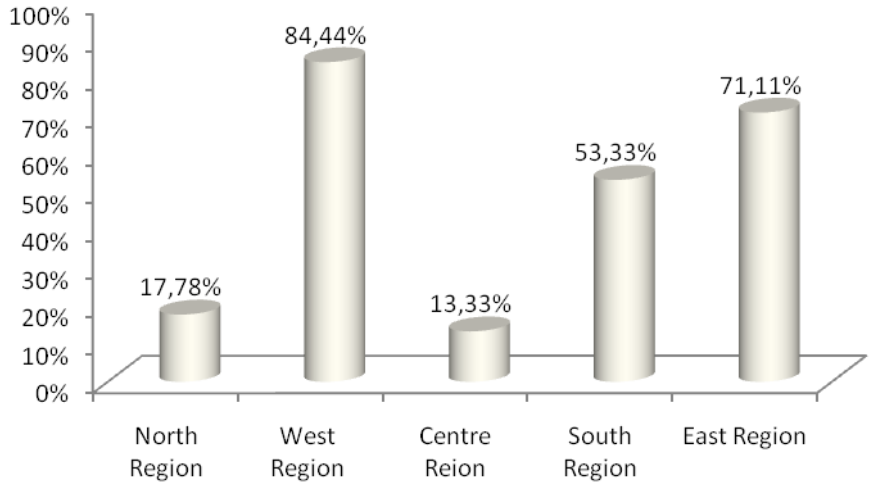

Figure 4. Quantization of performance.

3 regions have high scores: West (84.44%), East (71.11%) and South (51.11%) and 2 regions have low scores: North (17.78%) and Centre (11, 11%).

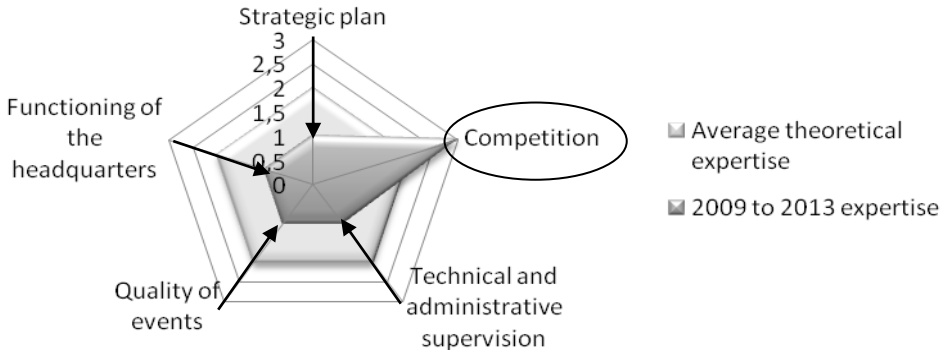

Figure 5. Assessment of activities achieved.

This graph shows an example from the R1CAA. The weak points are indicated by arrows in the previous theoretical expertise. The force area is circled on the recent expertise (2009 to 2013) that completely covers the previous theoretical expertise on the assessing axis : organizing competitions.

3.2.6 Potential accessibility of the grid on the ground

Table 6. Comparison of the evaluation grid with activity reports

Comparing elements	Evaluation Grid	Activities report
Dimension of the performance	Organizational Sports Promotional	Administration Competition Finance
Axis of performance	Functioning of the headquarters Competition Strategic plan Technical and administrative supervision Quality of events	No specified
Decision's centre	Secretarial / executive board Technical Direction Marketing direction	Office of director
Decision variables	15 variables of specified decision	No specified
Indicators of measure	20 indicators to specified measures	No specified

The assessing grid restores and completes the contents of activities reports.

3.3 Discussion

3.3.1 Validity of the evaluation grid

Concerning construct validity, the consent of fellows is shown by the emphasis on aspects and criteria notified on the Likert scale. Factorial subsequent analysis led to a structural and developed assessing grid. Therefore, this assessing grid provides the ability to directly appreciate the construct of organizational performance as perceived, represented and understood by actors at the top of the network. The organizational, promotional and sporting dimensions of this construct of performance have been identified among aspects (sports, internal social, societal, economic and financial, promotional and organizational) of the performance of a sports organization (Bayle, 2000) and recognized as central pillars of the functioning of a sports organization in certain circumstances, as in developing countries (Mayam, 2006).

The organizational aspect is described as being related quality of internal operations and services of the organization (Vail, 1985; Chelladurai and al., 1987 and Madella., 1998), sportive dimension recognized to be issued from the sovereign statutory and legal disposal of sports organizations (Winand and al., 2010) and promotional dimension seen as the media impact of the organization among those practising and the public (Mayam, 2006; Bayle, 2000). In African athletics context, the 2013 circular refers surely to administration, competition, finance and various business areas like network entities, but the organizational, promotional and sportive dimensions that contain these areas of activity are not yet measured by tools such as assessing grids. That is why the performance of an entity athletics is appreciated until then through indicators drawn from statistics of competitions (Truyens & De Bosscher, 2012; Soulas and al., 2013;. Glad & Locatelli, 2015)

In terms of content validity, the sample of items (15) of the assessing grid issued from decision-making levers (15) previously identified and selected by the actors. The choice of these actors shows the link between their understanding of the construct of organizational performance network entities and selected items. Moreover, considering the fact that ratings experts and scores result from measurement scales of multiple choice, a Cronbach Alpha test was performed. The items in the organizational level (α = 0.916) and those of the sports level (α = 0.823 average) are very homogeneous. The items of the promotional level (α = 0.5) are lowly homogeneous. The similar values of α were already observed by many authors (Amrani, 2018 ; Amifi & Benlakouiri, 2019 ; Asraoui et al., 2020 ; Hairout, 2021). Overall, the values of Cronbach's alpha cross 0.5 and approach (0.916) of the target value of 1. This reveals the consistency of the sample of items which has been included in the rightly internal structure of the assessing grid. Therefore, the development rubric is used to structure the assessments so consistent and faithful among its dimensions. Certainly not very similar content have been identified in the literature (Winand et al., 2010), in spite of the average level of the promotional consistency (α = 0.5), the deveveloped content of the assessing grid can allow to adequately estimate the construct of organizational performance in African athletics context.

Regarding criterion validity, different notified experts opinions were firstly discussed. Analysis of variance (F = 0.059 with p = 0.98 with 95% confidence interval) performed shows a similarity of experts opinions which reflects a representation and homogeneous understanding of the performance criterion of activities. This result confirms the adequacy of prior performance criterion of activities, including with respect to subsequent comparisons with the scores.

Thereafter, a correlation Spearman rank (R = 0.90; p = 0.037) showed a strong and significant association between the rows from the ratings and scores. If a similar coefficient of correlation (R = 0.96) has been observed by Richard and al. (1999) in an assessment framework between peer, a T test of Student for independent samples (T = - 2.18 and p = 0.06) confirmed the lack of difference between the sets and notations scores. Clearly, the ratings of the test and the scores are then associated; showing that experts opinion and the results of estimation made by the assessing grid are two coincident measures. In other words, the results from organizational performance represented by scores and achievements of activities evaluated by the experts are concurrent. Finally, a second analysis of variance (F = 18.516, p = 0.00001, with a 95% confidence interval) proves a significant difference between the typological groups observed: regional associations categorized as powerful have the highest performance scores. Moreover, a higher correlation coefficient of Pearson (r = 0.92038, with a 95% confidence interval) testifies the strong and positive linear association between ratings and scores. The degree of association between scores and ratings, and the checking of the above premise demonstrate the potential of concurrent and predictive validity of the assessing grid developed.

3.3.2 Reliability of the assesing grid

Besides evidence of internal consistency of the assessing grid ($0.5 \leq \alpha \leq 9.916$), a level of agreement of 60% was achieved between the rows due to ratings and scores. Several authors determined the consistency of a system of performance measurement from a Cronbach's alpha set at $\alpha = 0.4$ (Winand and al., 2010), and agreement levels were 81% recorded among peer assessors (Richard and al., 1999; Loose & Abraham, 1994). But in the current state of this pilot study, the internal consistency ($0.5 \leq \alpha \leq 9.916$) and equity (60%) observed are acceptable (Hairout, 2021).

3.3.3 Managerial usefulness of the evaluation grid

Scores were obtained by evaluation axis. The running of the headquaters: 11.11% (R1CAA and R3CAA), 55.56% (R4CAA) and 100% (R2CAA and R5CAA). The elaboration of strategic development plans: 0% (R1CAA and R3CAA), 55.56% (R4CAA and R5CAA) and 100% (R2CAA). Competition's Organization: 22.22% (R3CAA), 55.56% (R1CAA and R4CAAA) to 88.89% (R2CAA and R5CAA). Securing supervision: 0% (R1CAA and R3CAA), 77.78% (R5CAA), 33.33% (R4CAA) and 66.67% (R2CAA). The attraction of competitions: 22.22% (R1CAA and R3CAA), 33.33 (R5CAA), 55.56% (R4CAA) and 66.67 (R2CAA). The scores provided by the developed assessing grid in this network prouve the ability to obtain objective values other than the traditional competitions statistics. If it can help to consider differently the evaluation of network entities, it should be noted that scores provided by the assements grids have really been used as performance measures (Borteyrou and al., 2006; Diaz & Pena, 2005; Richard an al., 2000; The Agree Collaboration, 2002; Arcioni and Bayle, 2009). Thus, although the use of assessment grids for the performance evaluation is not yet effective in African athletics context, the developed assessing grid can be used for comparison, including strengths and weakness areas in the running of the network entities at the end of a given period.

3.3.4 Accessibility strengths of the evaluation grid

The Developed assessing grid restores the relation structures and provides a common frame of transversal activities and transferable from one network entity to another one. The administration is illustrated through organization and promotion. Competitions are part of sports activities. Even though finance recommended in reports is also identified in the literature (Bayle, 2000) as an aspect of the sports organizations performance, which was found marginal at the end of AFCP. The omission of this financial aspect of the construct of the assessing grid can be explained by financial grants from the International Association of Athletics Federations (IAAF) that seem to supply the network entities from the economic and financial constraints other than the strict respect of terms and conditions.

4. Conclusion

At the end of this pilot study, it clearly appears that the assessing grid of organizational performance developed in the associative network of the African athletics has a good potential of validity, fidelity and accessibility. It is therefore a tangible medium and objective assessment. With a view to extend

this work, we question the functionality of this assessing grid, which once proven, should allow network executives to have a close assessment procedure to African realities of this Olympic sport and use in their information system, an assessment tool with a validity well recognized for the management of organizational performance of athletics institutions in Africa.

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