Impact of Modern Science and Technology on Performance Assessment

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Abstract

Modern science and technology is a "double-edged sword". On the one hand, it not only improved competitive sports continuously created new sport items, but also improved the training equipment and training environment, promoted the movement technology and changed the sport values. On the other hand, modern technologies also contributed to the alienation of technology, and weakened the physical fitness activities, and lead competitive sports into deformity errors, which made fair competition become empty, and generated a series of uncivilized unfair social problems.Performance assessment of players specifically team based sports, is characterized by great complexity of constraints that make it difficult to objectify its observation and analysis. Key issues in this regard include the presence of regularities that are not detectable through inference visual or traditional methods of data analysis, the lack of standard instruments for observation and priority need to develop powerful, computerized systems coding, all of whom must be part of an approach that is suitable for natural and normal contexts. On-court basketball performance assessment of players (live match) at natural and normal contexts can be assessed by video analysis, notational analysis and scouting.The aim of this paper is to highlights the influence of modern science and technology on sport with special reference to performance assessment.

Key Words:*Performance Assessment, Basketball & Modern Science and Technology*

Introduction

Needless to say, the development of modern science and technology has become "the first Productive force". Sports as a special social phenomenon, has become a modern technology accessories. Either from the increase of the competitive level of sports, or from the improved health condition of athletes, sport is inseparable from the support and promotion of science and technology. "Knowledge Sport", the "digital sports', "High-tech Olympics" and other slogans all reflect the interaction and integration of modern technology and sports.

Competitive level of modern sports, especially high level of sport performance has been close to the limits of natural conditions of mankind, the idea of using the natural advantages, original training methods, to limit the movement of human beings, has long been a dream. The large number of computer technology, biological engineering, new materials and energy technology, information technology, and theory of modern science and technology have been widely used in sports fields, making the face of sports and sports training environment greatly changed and improved, training methods updated, site equipment improved, greatly improved the level of competitive sport, the wide range of functions and effects of sports therefore has been fully exhibited.

Performance Assessment – Team Based Sports

Basketball is one of the most popular team based sports and has been played by both men and women throughout the world. The study of the game by observing the behavior of the teams and players is not a recent phenomenon, characterized by a process that has evolved over time and that has accompanied the enormous growth of sports performance for the past 50 years. Traditionally, methods of analysis have used the frequency of occurrence of events (e.g., number of passes made in a certain area of the field or how many times a team committed an error) as an indicator of performance. This analysis based on the analysis of the frequency of certain performance parameters provided and continues to provide important information for coaches and athletes, enabling advances in training processes. However, the game of basketball is characterized by great complexity of constraints that make it difficult to objectify its observation and analysis. Key issues in this regard include the presence of regularities that are not detectable through inference visual or traditional methods of data analysis, the lack of standard instruments for observation and priority need to develop powerful, computerized systems coding, all of

whom must be part of an approach that is suitable for natural and normal contexts. On-court basketball performance assessment of players (live match) at natural and normal contexts can be assessed by video analysis, notational analysis and scouting. Basketball can be used to show many types of mathematical procedures that include identifying geometric shapes, choosing the right display of data and to interpret that data, the ability to predict outcomes, the ability to construct tally charts, scatter plots, and bar graphs, and finally the ability to change fractions to percents – all that draw in terms of statistics used to evaluate overall player performance and potential performance.

Figure – 1: Top performance players of the tournament series

The International Basketball Federation, more commonly known by the French acronym FIBA is an association of national organizations which governs international competition in basketball. It developed a software namely "*FIBA Live Stats*", which is used to assesses the performance of the basketball players during the competitions in terms of on-court performance related factors namely: *field goal - two point, three point and free throw basket made & missed, fouls made & received, offensive and defensive rebounds made, blocks made & received, assist, steal, turn over and performance efficiency.* The performance of each player was assessed by the sum of the positive and negative aspects of movements executed during the course of the game.

Table – 1: Performance related factors of Indian Railway Basketball Players

INDIA RLY

No.	Name	Min	Field Goals		3 Points		Free Throws		Rebounds			AS	TO	ST	Blocks		Fouls		PTS	Eff
			M/A	%	M/A	%	M/A	%	OR	DR	TOT				For	Rec	For	Rec		
* 6	V Vikram parmar	40:00	2/3	67	0/0	0	0/0	0	1	1	2	6	1	0	0	0	0	1	4	11
* 7	P Prakash mishra	40:00	8/10	80	4/4	100	2/4	50	0	1	1	2	0	1	5	2	3	1	22	25
8	V Vijay pamar	10:44	0/0	0	0/0	0	0/0	0	0	0	0	1	0	0	3	0	0	2	0	6
9	N Nikhil chopra	05:13	0/2	0	0/1	0	0/0	0	1	0	1	0	0	0	0	1	0	0	0	-2
* 10	G Gagan deep singh	35:00	13/18	72	0/0	0	9/13	69	2	8	10	1	0	0	8	5	2	5	35	47
11	R Rakesh kumar yadav	00:00	0/0	0	0/0	0	0/0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 12	D Dilawar singh	30:39	5/9	56	3/6	50	6/6	100	3	0	3	3	1	1	4	3	4	3	19	21
13	S Sujith reddy	00:00	0/0	0	0/0	0	0/0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 14	S Sunil kumar	37:01	4/6	67	0/1	0	0/0	0	1	4	5	1	0	0	0	1	5	0	8	6
15	J Jasjot singh	01:23	0/0	0	0/0	0	0/0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals:		200:00	32/48	67	7/12	58	17/23	74	8	14	22	14	2	2	20	12	14	12	88	114

Coach: SENTHIL SELVAN   **Assistant Coaches:**   SIVANADAM

Performance Assessment in Athletics

OMEGA was the first company to be entrusted with the official timekeeping of all disciplines at the Los Angeles Games in 1932 using chronographs and stop-watches developed by its subsidiary Lémania. OMEGA's association with the Olympic Games led to over three quarters of a century of pioneering developments in the field of sports timekeeping.

One of the first innovations by the brand was the world's first independent, portable and water-resistant photoelectric cell (1945). This was later followed by the world's first photofinish camera, the Racend OMEGA Timer (1949), which was a major innovation that solved the problem of grouped arrivals in track events. At the Helsinki 1952 Olympic Games, OMEGA became the first company ever to use electronic timing in sport, with the OMEGA Time Recorder (OTR), which was sanctioned by the International Amateur Athletics Federation on the basis of a rating certificate from the Observatory of Neuchâtel that proved it was accurate to within 0.05 seconds in 24 hours.

Modern Sport Technology in Designing sports Equipment

Sporting technologies are man-made means developed to reach human interests or goals in or relating to a particular sport. Technology in sports is a technical means by which athletes attempt to improve their training and competitive surroundings in order to enhance their overall athletic performance. It is the knowledge and application of using specialised equipment and the latest modern technologies to perform tasks more efficiently. Examples of sporting technologies include golf clubs, tennis rackets, pole vault poles, athletic sports gear (clothing and footwear), advanced computer stimulations and motion capture.

Computerized Software Assessing sports performance

Technologies such as CAD (Computer Aided Design) can play a major role in the improvement of sporting equipment. CAD offers an efficient means of considering and assessing new products and ideas, and is primarily used to improve safety, comfort and effectiveness of specialised sports equipment. Other technologies such as 'smart' equipment can be used to evaluate human performance. These include sensors and computers as part of their utility and can be used by athletes as part of their training regime. Examples of 'smart'

equipment technologies include devices used for exercise stress testing and cardiovascular assessment, human reaction time and frequency of movement meters, and jump and run characteristics devices. More modern technologies such as motion capture analysis are also used to analyse athletic performance.

This involves digitally recording the movements of athletes during sporting activities which can then be used for personal performance evaluation by the sports person, for enhanced spectator entertainment, and in some cases medical treatment.

Conclusions

Sporting performance has increased dramatically over the past millennium. While much of this performance enhancement can be attributed to better training, diet, desire to win etc it is clear that advanced designs and the materials of construction have made a major impact in some sports. In the 100 m sprint, it is likely that the strength, power, and will to win of the athlete is dominant and that no technological development has arrived to require a rule change. The pole vault has seen heights increase dramatically with the introduction of flexible poles in the 1960's. Here the adaptation of the athlete to the new equipment and the capabilities of the equipment have produced the gains. The technology is available to all athletes and the ruling bodies have not deemed it necessary to alter the rules to keep heights low. The rules of javelin have been altered by mandating the equipment that can be used to reduce throw lengths and make the sport safer for fellow athletes and spectators.

Thus, there is a balance between technology and tradition and the sport ruling bodies either allow technology to advance a sport (such as in the pole vault) or use it to under-engineer a sport (such as the javelin). Is it cheating? Well, as long as the same technology is available to all competitors at the same time, then ultimately it comes down to the ability and skill of the athlete. Problems only arise when technology is available exclusively to only one group of athletes. Happily, a century on from Baron de Coubertin's original vision of the Olympics, the motto "swifter, higher, stronger" is ultimately still dependent upon the skill of the athlete.

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