Information Technology Applications and Challenges: An Empirical Study of National Sports Associations of Zimbabwe

Edmore Nhamo[1], Simbarashe Magonde[2]

[1,2]*Department of Health Science, Faculty of Science and Technology, Zimbabwe Open University, Zimbabwe*

--*ABSTRACT*---

The use of Information Technology (IT) in the training, officiating and management of sport has gained significant ground and has revolutionized the international sport industry. However in spite of this widespread adoption of Information Technology in the sport industry in developed countries, the situation in Zimbabwe seems to suggest that Information Technology applications in National Sports Associations (NSAs) have remained depressed and have not reached their full potential. This study exposes and discusses both the extent of Information Technology applications and the reasons for the limited utilization. The findings and recommendations provided are expected to help National Sports Associations of Zimbabwe to recognize the gap and develop relevant strategies for improvement. The results indicate that the use of Information Technology applications in National Sports Associations of Zimbabwe is lagging behind. This study recommends that the teacher training curriculum should be changed, National Sports Associations in Zimbabwe should make IT applications an integral part of their strategic plans and invest more in information technology training, equipment and infrastructural development.

KEY WORDS: *Challenges, computer applications, information technology applications, National Sports Associations, Zimbabwe.*

Date of Submission: 8July. 2013   Date of Publication: 25.July 2013

I.   INTRODUCTION

In today's world of rapidly advancing technology computers are being used in almost every activity. It is difficult to find any field of human endeavour that has not been impacted by computers. As Agere (2013) write the era of ICT has taken over every sphere of life. The emergence of sophisticated software and gadgets has made life fast and easier. The world of sport is no exception. The world of sport is naturally very dynamic and the use of information technology is one of the developments that have made a significant impact on many modern day sporting disciplines and organisations. It has been observed that most professional sports in the United States of America and other similarly developed nations in the global north now make extensive use of computer technology in administration, coaching and officiating which have revolutionalised and enhanced the standard and status of their sport. For example developed countries have used technology based instant replays and other high tech aids to help referees make the right call (Topend sport 2013). A look at the Zimbabwean sporting industry seems to give a totally contrasting picture. Even the e-readiness survey report (2003) observed that Zimbabwe was lagging behind technologically as it did not have an integrated and coherent national Information and Communication Technology (ICT) policy then. The absence of a coherent ICT policy has invariably inhibited coordination, harmonization and full utilization of the existing infrastructure. It affects the capacity and initiatives to implement by various sectors of the economy. This was also compounded by the decade of economic recession which Zimbabwe experienced around 2008.

However in spite of all these negatives the Ministry of information and technology (2010) as articulated in their 2010 to 2014 strategic plan, insist that the use and diffusion of ICTs for national development has continuously been reflected and articulated in several government documents and statutory instruments such as the Science and Technology Policy of 2002. In addition the Ministry of Science and Technology Development was tasked with the development of an overarching National ICT Policy framework at its inception. It conducted extensive consultations nationally and working with the National Economic Consultative Forum and other stakeholders it ultimately produced the National ICT Policy Framework document of 2005.

The above mentioned document was approved by Cabinet and then officially launched by His Excellence the President of the republic of Zimbabwe in September 2007. This development, coupled with the rapid impact of ICTs across all sectors of the economy and congruent with the national economic development agenda, precipitated the formation of a whole new Ministry to ICTs. In 2012 the new Ministry of Information and Communication Technology (MICT) embarked on a two month long process to craft a new ICT Policy. ICT Minister Nelson Chamisa explained the rationale for the review saying "it has been six years now, the time has come for a review of this policy, more so considering the rapid nature in which the revolution of technologies for information and communications take place". In spite of all these developments ICT utilization in Zimbabwe still lags behind countries like South Africa. It is against the above background that this study intents to establish the extent to which NSAs have complied with the local and international development in the ICT sector. According to Kundishora (2010) Systematic exploitation of ICTs offer developing countries Zimbabwe included, an opportunity to leapfrog into the developed world community.

1.1 Purpose of study

This study examined information technology applications in National Sport Associations (NSAs) in Zimbabwe. The purpose of the study was to provide an overview of the extent to which NSAs in Zimbabwe use information technology in administration, training/coaching and umpiring/referring and the challenges they are facing.

1.2 Research question

To what extent do Zimbabwe National Sports Associations use Information Technology and what challenges do they face ?

1.3 Research Objectives

a. To establish the prevailing skill preparedness level of Zimbabwe National Sports Associations in the use of information technology
b. To find out the information technology Infrastructure available for use by Zimbabwe NSAs
c. To ascertain the specific Information technology Applications used by Zimbabwe NSAs in administration, coaching and umpiring
d. To assess the challenges faced by Zimbabwe NSAs in their quest to utilize information technology

II. INFORMATION TECHNOLOGY APPLICATIONS IN SPORT: A THEORETICAL FRAMEWORK.

Information technology (IT) is the use of technology and the application and benefits derived from it in all spheres of human endeavour. IT refers to the management as well as the processing of information in organizations and by individuals. IT specifically deals with the use of electronic computers as well as computer software to convert store and process, transmit, retrieve and protect information.(Tusubira and Kyeyune ,2001; Wade 2013). It follows that IT applications in sport refer to the manipulation and utilization of electronic computers and software in order to achieve the day to day objectives of sport. Sport on the other hand is defined by Wade (2013) as a collective term meaning games or competitive activities. The literature reviewed reveal that computers have been applied mostly but not restricted to the following three main areas i.e. administration, coaching and umpiring/officiating.

2.1 Administration

Brown (2013) identifies communication as one of the administrative activities of a coach and a national sports association. Coaches and associations need to effectively communicate with athletes and other stakeholders. Brown also identifies marketing as another area of administration. The association is often required to advertise itself through the use of websites. The coach is often required undertake marketing to potential members in order to ensure that there is constant supply of athletes. National associations are also required to track the progress of players. According to Glencore (2013) today professional colleges and even school sports teams have their own websites. Computers are also widely used in sport to keep statistics for example how many games your national team has played etc. In addition to the above basic day to day administrative functions of computers in NSAs, literature also reveal that computers can control the sale of tickets for different events, computers can record results and lists of world records can be kept up to date. Computers can be used to produce fixtures, programmes etc.

2.2 Coaching/Training

Baca and Dabnichki (2008) say that coaching is one of the earliest areas of application of computer science in sport. The link between sport and biomechanics has been there from the very beginning. They argue that the most valuable tool in this relationship has been the development of biomechanical models that are utilized in both performance analysis and equipment selection and development. In this regard computers can be used to improve for example water sport, where according to Baca et al (2008) "from ancient times the vast water pools on the planet have been perceived as both a barrier and a challenge". Computers allow this barrier to be broken and hence the provision of constructive feedback for performance improvement in water sport. Brown also argues that computer analysis of an athlete helps to provide feedback and cause improvement. Analysis can take place from the coach's observation through the use of sophisticated software. Tactics, techniques and physical fitness are parameters that can be analyzed by coaches using computers. Biomechanical analysis can help Pitchers in softball become better Pitchers and Batters become better Hitters.

Literature reveals that there are numerous software packages that are designed for fitness and nutrition professionals to organize data and produce reports. The following are a few selected examples:

✓ Team beep Test - Most versatile and useful software for conducting and recording the bleep/beep test with all results recorded directly onto your computer
✓ Body Byte – Universal standalone computer software program specially developed to comprehensively organize and manage all information associated with nutrition, training and fitness.

World of sport science (2013) talk about the concept of computer simulation in training and coaching, which is a process by which specific anticipated effects that the athlete will experience in the course of performance are replicated through a computer. The outcome of an event can be predicted by using actual data gathered concerning previous similar events. The simulation may be designed to either mimic the desired competitive or racing environment or to project what is a desired result of a particular athlete or team. The simulation is constructed on a series of mathematical codes that are used to build the programs that are the basis for the visual and graphic replication of the simulated event.

2.3 Umpiring/Officiating : Examples of   information technology applications include Basketball referees who use replay systems to make sure that players are shooting within the time allotted by the shot clock. International cricket uses a third umpire, who sits off the field with access to replays or disputed situations and advise the central umpire. Hawk- eye technology is a typical example of a computer and camera system which traces the trajectory of a ball. It is used widely in international cricket and tennis. Accurate timing of athletic races such as the London marathon and car races like the British Grand Prix are controlled by computers.(Topend sport, 2013)

According to Topend sport (2013), while most professional sports have long used instant replays and other high tech aids to help referees make the right call there has been resistance in some sport codes. For example the need for goal line technology in soccer has been realized but not yet implemented. Particularly as TV replays are showing wrong decisions by the referees. A promising prospect has been a "smart ball" loaded with a computer chip jointly developed by German companies Cairos Technologies and the Fraunhoter Companies' Technologies. This technology uses a network of receivers around the field designed to track the ball's precise position in real time, including when it has passed the goal line. The information would be relayed in less than a second to a watch like device worn by the referee. However the system has its setbacks and another system using the hawk eye is being looked at. The hawk-eye is a camera and computer system which traces the trajectory of the ball. It is being used in international cricket and tennis and many other sports are also looking at making use of this technology.

2.4 Challenges

Research show that fear of change, lack of qualifications in ICT skills and obsolete equipment are the major challenges that teachers face in trying to keep up with latest trends of technology. Research on ICT uptake in education conducted in Zimbabwe has revealed that one of the biggest reasons why there is slow utilization of ICT in Zimbabwe could be emanating initially from the type of the education system. This link is important because NSAs are being run by people who are products of the same education system. According to Agere (2013) in Zimbabwe, the era of improving ICT in schools gained momentum at the turn of the new millennium with President Mugabe leading through the Schools Computerization Programme. The initiative has been embraced by many schools that have gone further to establish computer laboratories. However, in spite of most schools having joined the international migration towards ICT and ICT band wagon, educationists say it is worrying to note that the development is not commensurate with local investments to equip the tutor.

The country's teacher training module is seen as lagging behind on the requisite ICT training before the teachers are deployed to the schools. Zimbabwe Teachers Association Chief Executive Officer Sifiso Ndlovu is cited by Agere (2013), as concurring with the above observation. Ndlovu is cited as saying "I can confirm that indeed our teachers are facing difficulties in embracing modern technology." It is difficult for teachers to embrace new technology as it was never in their learning curriculum during training. The situation is made worse by constant power outages experienced in Zimbabwe. As Agere (2008) avers research shows that fear of change by teachers, lack of qualification in ICT skills and obsolete computers are the major challenges that tutors face in trying to keep up with latest trends in technology.

III. METHODOLOGY

The study used a mixed method approach which enabled the researcher to collect both quantitative and qualitative data. The study used an e-mailed questionnaire to collect data from the representatives of all 52 registered National Sports Associations. Twenty five (25) NSAs responded thereby constituting a 48 % response rate. The questionnaire was designed to collect data on their level of IT expertise, current level of skill to use IT hardware and software, availability of IT infrastructure as well as the challenges they faced. The questionnaire contained both closed and open ended questions. The face validity of the questionnaire was established by pilot testing and giving the questionnaire to experts to comment on its validity. The study also interviewed Provincial Sports Associations (PSAs) based in Bulawayo for purposes of data triangulation and validation. The PSAs in Bulawayo were purposively sampled.

The results obtained from the study are presented in the next section

IV. RESULTS

4.1 NSAs state of preparedness to embrace IT applications

Table 1: NSAs' preparedness for IT Applications

No	Question	Novice	Intermediate	Advanced
1	What is the level of computer expertise in your National Sport Association in terms of general IT usage?	6(24%)	17(68%)	2(8%)
2	What is the level of computer expertise in your National Sport Association in terms of sport specific IT applications in training and coaching?	25(100%)	0(0%)	0(0%)
3	Rate the level of computer expertise in your National Sport association in terms of sport specific IT applications in officiating / umpiring/refereeing?	23(92%)	2(8%)	0(0%)

(N= 25)

The data collected shows that the current level of IT expertise of surveyed NSAs in IT applications in administrative activities is average. The majority i.e. 68% rated the level of computer expertise in their NSA as Intermediate. Twenty four percent (24%) rated their expertise as novice and only 8% rated their expertise as advanced. Regarding the level of expertise in the use of specific IT applications in training and coaching, 100% indicated that they were mere novices. The majority constituting 92% of the respondents indicated that their level of expertise in the use of specific IT applications in officiating and umpiring is very low (novice).

4.2 Professional development

Table 2: Professional development needs

No	Question	Yes	No
4	Do you feel that you need professional development in the use of IT applications?	25(100%)	0(0%)

All NSA surveyed i.e. (100%) were of the opinion that they could benefit tremendously from staff development initiatives.

4.3 IT Infrastructure

Table 3: IT Infrastructure (hardware and software) Availability

No	Question	None	Inadequate	Fairly adequate	Adequate
5	Availability of IT infrastructure (hardware and software) for administrative purpose?	0(0%)	10(40%)	15(60%)	0(0%)
6	Availability of IT infrastructure (hardware and software) for coaching/training purpose?	23(92%)	2(8%)	0(0%)	0(0%)
7	Availability of IT infrastructure (hardware and software) for officiating/umpiring/refereeing purposes?	22(88%)	3(12%)	0(0%)	0(0%)

On availability of IT infrastructure for administrative purposes 60% said it was fairly adequate and 40% indicated that it was inadequate.

Results show that 92% of NSAs do not have IT hardware and software for coaching and training. Only 8% indicated that they possess specific IT infrastructure for coaching and training purposes.

The data collected show that 88% of the NSAs do not have specific IT hardware and software for umpiring or officiating. On the other hand only 12% confirmed that they do possess hardware and software which assist in the process of umpiring/officiating.

4.4 The level of IT practice and activities

Table 4: Use of IT by NSA

No	Question	Yes	No
8	Use of IT infrastructure (hardware and software) for administrative purpose?	25(100%)	0(0%)
9	Use of IT infrastructure (hardware and software) for coaching/training purpose?	2(8%)	23(92%)
10	Use of IT infrastructure (hardware and software) for officiating/umpiring/refereeing purposes?	3(12%)	22(88%)

Regarding the actual use of IT infrastructure, all NSA surveyed indicated that they make use of IT infrastructure for administrative purposes.

Result show that 92% do not make use of IT infrastructure for coaching/training purposes, while only 8% do.

The majority 88% revealed that they do not make use of any specific hardware and software in their training and coaching activities.

4.5 Examples of specific IT applications used by NSAs

The respondents were asked to specify examples of specific software they use in coaching/training or umpiring /officiating. The majority revealed that they make use of power point, excel, word-processing and database applications for purposes of producing fixtures, programmes compiling results and keeping records. Most also indicated that they use email for communication and websites for marketing. In terms of coaching/training and officiating/umpiring only a few indicated that they use these as alluded to earlier on. These few NSAs identified timing races and hawk eye software.

4.6 Challenges

Table 5: Challenges faced by NSAs in using IT applications

No 11	Challenge	Number
i	Lack of exposure to relevant software and hardware	25(100%)
ii	Lack of suitable sporting facilities where the necessary hardware and software can be installed	23(92%)
iii	Lack of support from government	25(100%)
iv	Lack of technical support from international federations	18(72%)
v	In adequate training for coaches, referees and administrators	25(100%)
vi	Lack of resources to purchase the necessary hardware and software	25(100%)

In addition to the challenges listed in table above NSAs also cited fear of change and persistent electrical power outages experienced in Zimbabwe as significant barriers/challenges.

V.   DISCUSSION

It is clear from the results of this study that there is limited utilization of IT infrastructure by Zimbabwe National Sports Associations. However it is also clear that NSAs recognize the need for them to adopt modern IT applications to improve the quality and enhance the status of their sport. Although IT has not yet revolutionalised the Zimbabwean sports industry as much as it has done in the developed countries ,it is apparent that it has changed the manner in which business is now being carried out in the sports industry. This is so in particular reference to NSA's administrative functions. However it should be noted that this approach is rather limited since administrative applications tend to be basic applications of IT. The NSAs should strive to use more advanced IT applications in training/coaching and officiating umpiring activities. NSAs seem to have satisfactorily adopted basic IT applications for administrative purposes. The majority i.e. 65% rated the level of computer expertise in their NSA in administrative applications as Intermediate.   On availability of IT infrastructure for administrative purposes 60% said it was fairly adequate. Regarding the actual use of IT infrastructure, all NSA surveyed indicated that they do make use of IT infrastructure for administrative purposes in one way or another. The NSAs seem to have adopted the IT applications in administrative work in line with international trends. As pointed out by Brown (2013) that, communication and marketing are administrative applications of IT used by sports organizations. Glencoe (2010) argues that, these days professional colleges and even school sports teams have their own websites for marketing and publicity. Computers are also widely used in sport to keep statistics for example how many games your national team has played etc. However it is not clear from the results whether NSAs are able to use advanced and sophisticated administrative IT applications such as those used in the control of ticket sales in addition to the basic day to day administrative functions of computers. Literature reviewed confirms that in NSAs, computers can control the sale of tickets for different

events, computers can record results and lists of world record can be kept up to date. Some of these applications are quite basic while others require sophisticated software and computer based gadgets.

National Sports Associations cannot be expected to be successful in the adoption of IT applications in training/coaching and officiating umpiring without the availability of appropriate infrastructure. This study indicated that 92% of NSAs do not have appropriate IT hardware and software for coaching and training. The data collected also show that 88% of the NSAs do not have specific IT hardware and software for umpiring or officiating. On the other hand only 12% confirmed that they do possess hardware and software which assist in the process of umpiring/officiating. As observed by Cuban (2001) limited IT infrastructure results in limited applications. Baca and Dabnichki (2008) say that coaching is one of the earliest areas of application of computer science in sport. They argue that the link between sport and biomechanics has been there from the very beginning. However as revealed by this study this link is still very weak in Zimbabwe.

The use of IT applications is directly related to the availability of the appropriate IT infrastructure as discussed above. The study indicates a very low usage of IT applications in coaching/training and officiating /umpiring. Results show that 92% do not make use of IT infrastructure for coaching/training purposes. The majority 88% revealed that they do not make use of any specific hardware and software in their officiating and umpiring activities. The reason can be linked to the unavailability of IT infrastructure as NSA cannot be expected to use infrastructure which they do not have. The NSAs surveyed identified lack of exposure to relevant software and hardware, lack of suitable sporting facilities where the necessary hardware and software can be installed, lack of support from government, lack of technical support from international federations, inadequate training for coaches referees and administrators, lack of resources to purchase the necessary hardware and software, fear of change and the persistent electrical power outages experienced in Zimbabwe as significant barriers/challenges. These findings are supported by similar finding in the adoption e- learning applications in Zimbabwe. The findings were made by Chitanana, Makaza and Madzima (2008). These authors also identified challenges such as: lack of technical support (51%), lack of administrative/initiative at Faculty level (52%) and lack of awareness regarding ways of integrating the software into teaching (52%). which are related to infrastructural development, support and pedagogical considerations for e-learning. It is clear from this study that inadequate training for coaches, referees and administrators as a challenge can also be linked to the type of education received by the respondents. As stated by Agere (2013), the Zimbabwean teacher training module is lagging behind on the requisite IT training before the teachers are deployed. While the demand of IT learning is high, there is serious lack of qualified teachers in ICT. NSAs administrators could be finding it difficult to venture into the ICT because it was never part of their curriculum at school.

VI.   Conclusion and Recommendations
The findings of this study lead to the conclusion that IT applications in NSAs of Zimbabwe are inadequate and that NSA face numerous challenges that range from their education curriculum, to lack of resources in their quest to adopt IT applications.

In light of the above conclusion it is recommended that:

- ✓ The education curriculum for teachers be revolutionalised to match the latest technological advancements with a relevant example being South Africa where the idea has been synchronized into teacher training syllabi (Agere 2013). This will enable these teachers to produce school graduates who are I compliant since it is the same graduates who end up running National Sports Associations
- ✓ National Sports Associations in Zimbabwe should make IT applications an integral part of their strategic plans and invest more in information technology training, equipment and infrastructural development.
- ✓ Government through the Sports and Recreation Commission should provide more support to NSA to adopt IT applications

REFERENCES
[1]   Agere H (2013) ICT: Teachers' worst nightmare, The Sunday Mail In-Depth May 19-25,
[2]   Topendsport (2013) Assisting the umpires/Referees. (Online) [Retrieved on the 25th of June 2013] from www.topendsport.com
[3]   Government of Zimbabwe (2005) Information and Technologies in Zimbabwe: PROJECT ZIM/03/003: Zimbabwe e-readiness survey report: Department of Science and Technology Development in the Office of the President: Harare: Government printer
[4]   Ministry of Information Communication and Technology (MICT) (2010), Strategic plan 2010-2014. Harare, Zimbabwe
[5]   Kundishora. S (2010) Ministry of Information Communication and Technology (MICT) (2010) Strategic plan 2010-2014. Harare, Zimbabwe
[6]   Science and Technology Policy (2002), Harare: Government printer
[7]   Government of Zimbabwe (2005), National Information and Communication Technology (ICT) Policy framework: Harare
[8]   Ministry of Information, Communication and Technology ICT policy 2012, Harare

[9]   Tusubira F.F and Kyeyune (2001) Tutorial paper: What is Information and communication Technology? (online) [retrieved on 20 June 2013] from www.fftusubira.com

[10]   Wade, A. (2012) Information Technology: What is it and what does it mean to you? (Online) [Retrieved on the 5 th of July 2013] from: www.articlesnatch.om

[11]   Brown, C. (2013) Technology to use in your coaching, (online) [retrieved on the 2nd of July 2013] from www.sportscoachuk.org

[12]   Glencoe (2010), Computers in sport, Mc Graw Hill (Online) [retrieved on the 10th of June 2010] from: www.techconnectonline: technology foundations

[13]   National Association for Sport and Physical Education, an association of the American Alliance for Health, Physical Education, Recreation and Dance, (2009).Appropriate Use of Instructional Technology in PE (Online) [retrieved on 2nd of July 2013] from www.aahperd.org/naspe

[14]   Cuban, A. L. (2001). Oversold and underused: Computers in the classroom. Cambridge, a: Harvard University Press

[15]   Baca A and Dabnichki P (2008) Computers in sport Wit Press: UK

[16]   World of sport science (2013) Computer simulations as a training tool. (Online) [retrieved on the 1st of July 2013] from www.woldofsportscience.com.

[17]   Chitanana, L., Makaza, D., & Madzima, K. (2008, July 5). The current state of e-learning at universities in Zimbabwe: Opportunities and challenges. *International Journal of Education and Development using ICT* (Online), 4(2). [retrieved on the 5th of may 2011] from: http://ijedict.dec.uwi.edu/viewarticle.php.