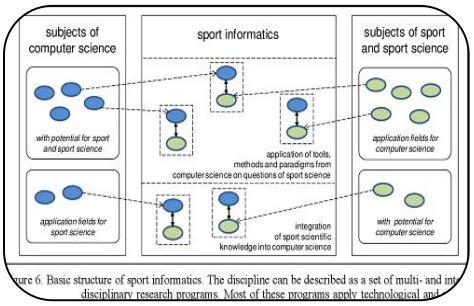
Review Of ReseaRch
Impact Factor : 5.7631(UIF) UGC Approved JoUrnAl no. 48514 ISSN: 2249-894X
Volume - 7 | Issue - 12 | September - 2018

INFORMATION TECHNOLOGY AND ITS INFLUENCE ON SPORTS- SPORTS INFORMATICS

Shakeeb Mohammad Dar

ABSTRACT :

Sports information processing and information technologyare conceivably the utmoststimulating and speeding disciplines across all of sports science. The incrediblecorrespondingevolutionand growth in digital technology, non-offensive sensor strategies, technology vision and machine erudition have permitted sports analytics in behaviorsfeasibly never perceivedformerly. This progress provides great challenges for new participants and hardenedold hand of sports analytics alike. Keeping pace with new technological innovations requires a thorough and systematic understanding of many diverse topics from computer programming, to database design, machine learning algorithms and sensor technology. Nonetheless, as quickly as the state-of-the-art technology changes, the underpinning skills and knowledge about information technology in sports are eternal and lifelong. Additionally, possessions for students and practitioners across this range of areas are infrequent and provides much of the groundwork knowledge obligatory for working in sports informatics. This is positively a wide-rangingtranscript that will be a treasuredreserve for numerous readers.



ure 6. Basic structure of sport informatics. The discipline can be described as a set of multi- and inte disciplinary research programs. Most of these programs apply technological and

KEYWORDS : *Information Technology, Sports Informatics.*

INTRODUCTION :

In present-daydiscipline, knowledge and literature, no field of endeavour is ever accurately independent and sovereign of other fields, and this is exclusively true of the rapidly and swiftlyevolving field of informatics and information technology in sport. Notational study, the historical study of patterns, tactics and strategy is distorted from its early form and dependence on manual (pencil and paper) data collection and summary statistics. The progression of technical tools, primarily in the province of computers and digital video, have led to reflectivedeviations in notational analysis and performance analysis, and eventually to the birth of possibly a new field of sports science in its own right – sports informatics. Modern sports informatics is empowered by melodramatic parallel expansions in information technology, machine learning and even artificial intelligence and that the textbook addresses much of the foundation knowledge required for students and researchers to engage actively in this field of examination. Information technology in sports may now be interchangeably named with sports informatics. Even though in practice research in information technology in sport may address areas that are not strictly sports informatics (such as computer vision or machine learning), and sports informatics research reaches to areas less dependent on information technology, there is sufficient overlap in the context to consider both as being at the vanguard of exciting new research that enables all of the traditional fields of sports science.

Over the past four decades, the discipline Sports Informatics also known by the name, *"Computer Science in Sports"* has turn out to be an imperative part in the field of Sport Scientific and Technical Research. The term shelters all the activities at the edge of information technology and sports science, oscillating from modest and simple tools for supervising and handling data and governing sensors on to the demonstrating and recreation of composite sports linkedspectacles. Today, information technology is a well-established research field. An International Association on Computer Science in Sports (IACSS) has existed since 2002 which has been largely the only formal organization supporting a community of practice in sports informatics that indorses and promotes research in this area. In various countries such as Germany, Australia, Croatia, China, Turkey, England and India countless national workgroups have been recognized which represent Sports Informatics in the national scientific community and subsidize new technological high-tech inventions and innovations to sports. The IACSS maintains good relation with various other sports scientific organisations like the International Association for Sports Information (IASI), the International Council of Sports Science and Physical Education (ICSSPE) or the International Sports Engineering Association (ISEA).

Sport is dynamic and uncertain, yet there are undoubtable regularities in athlete behaviour and performance. The availability of large-scale, highly-dimensioned sports data presents many challenges to researchers at the very edge of contemporary information technology to reveal insights about complex cooperative and competitive behaviour by athletes. The relationship between information technology expertise and the province of the sports coach, and propositions an imaginary "institute" whererealm experts in sports and informatics work impeccably together. More recurrently, it is coaches and sports scientists with minimal information technology training who are responsible for the design and implementation of database systems in sport.

If erudite algorithms are the engine for gaining insight in sports informatics, then data is the fuel. High quality data is at the core of any meaningful attempt to understand behaviour and causality in sports performance.Moreover, modern sports informatics is characterized by two additional challenges; to measure performance *in-situ* without impacting on the performance itself, and enabling real-time analysis of performance in such a way that a coach (or athlete) is able to moderate and optimize an ongoing performance.Much of the sports informatics domain is about the interface between coaches, data, and maximizing the insight that the former can glean from the latter. But another area that is lessfrequently considered by sport-focused computer scientists and data specialists is that of optimizing the learning and training of the athlete.

Interdisciplinarity of Information Technology and Sports Informatics:

Advanced modelling and analysis software have been applied to a wide variety of sports related problems. Many of these software's are based on Artificial Intelligence (AI) techniques. Effective presentation and visualization of data can improve cognitive understanding of complex data outputs and be beneficial to coaches and athletes. Virtual reality and immersive environment applications also have an important place in sports, given their demonstrated effectiveness in preparing athletes for competition and training. There are many ways in which the concept of "interdisciplinarity" has been classified by philosophy of science. One milestone in nomenclature was a congress in the year 1972, where the OECD proposed a classification of interactions between disciplines (OECD, 1972). In terms of this definition, multidisciplinary is a juxtaposition of various disciplines without a connection between them. Interdisciplinarity describes any interaction between disciplines, which can range from simple communication of ideas to the integration of concepts, methodologies and epistemologies. Transdisciplinary is the highest degree of cooperation and stands for a common set of theories and axioms for a set of disciplines (Fig. 1). On this basis, enhanced models, focussing on different aspects of interaction were developed: Heckhausen (1972) for example identifies six types of interdisciplinary research, Boisot (1972) advises three categories of interdisciplinarity, Karlquist (1999) lists five modes of interdisciplinarity.

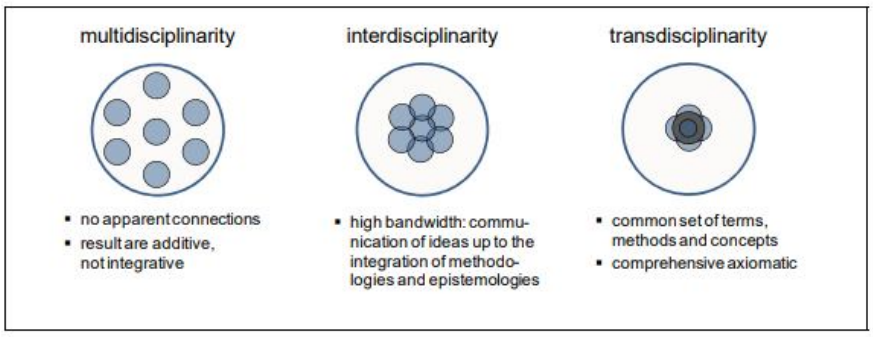
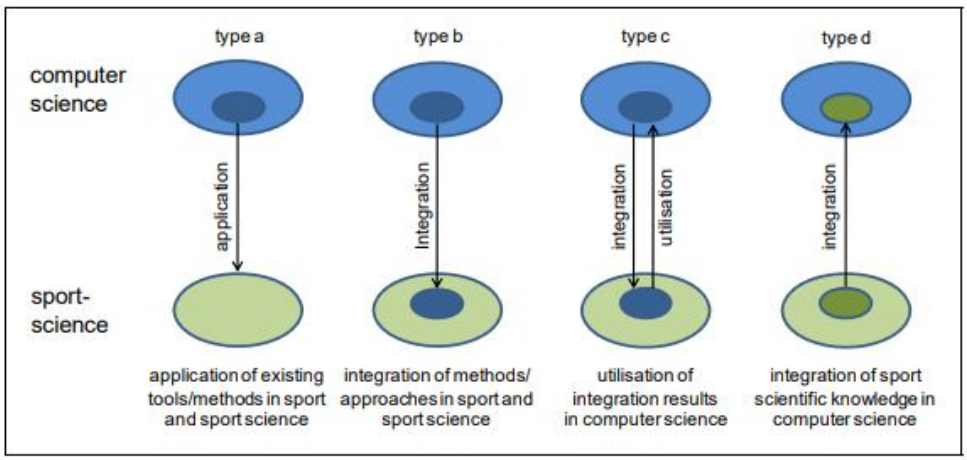


Figure 1

When looking into the practice of sport informatics, it emerges that not any of these models is adequate to describe the existing interaction. The borrowing of computer scientific methods (type a, b, c) matches to Heckhausens concept of auxiliaryinterdisciplinarity. The simple usage of pre-defined tools (type a) corresponds to the OECD-term multidisciplinary. The corporate development of tools/methods (type b) can be called pseudo-interdisciplinarity (Heckhausen) or restrictive interdisciplinarity (Boisot). The use of sport scientific knowledge in computer science (type d) accords with the idea of structural interdisciplinarity (Boisot). In this regard, this paper proposes an own classification, using four types of cooperation (see Fig. 2):



- Type a: Sports science applies existing approaches and tools from information technology. In this case, sports science does not take part in conceptualization and development. information technology(or - being more precise - commercial software developing companies) only act as an anonymous service provider, without contact with sport science.
- Type b: Sport science integrates knowledge from information technology. This happens, when its own area of studies needs technical solutions, which do not exist on the market. Knowledge is assimilated either by acquiring the skills necessary or by entering into partnerships with information technologye.g., by means of student or third party funded projects. One aspect of this cooperation is that computer science provides nothing but skills in software development. There is no collaboration on a scientific level.
- Type c: Computer and sports science cooperate in research programs, which are in accordance with the research interest of both disciplines. Examples are the use of artificial neuronal networks for analysing movement patterns or application of image recognition algorithms in sport game analysis. In these cases, computer science gets new insights by validating concepts and methods which have relevance for additional - perhaps more complex - problems. Sports science benefits from an

improved and faster data acquisition and by getting a different perspective on the structures of sport.

- Type d: This type is comparable with type c, with the difference that paradigms and knowledge of sport science are used in computer science. An example would be the use of kinesiological models in controlling the motion of humanoid robots.

Statement – A self-description of Sports informatics:

Having the discussion of the last sections in mind, we suggest differentiating between sport informatics and computer science in sport. Computer science in sport stands exclusively for the use of computer technology in sport and sport science. Sport informatics also includes the application of methods and paradigms from computer/information science as well as from research programs, which try to transfer sport scientific knowledge to computer sciences. The following definition shows this enhanced self-concept:

"Sports informatics is a set of multi- and interdisciplinary research programs at the interface of sport science and computer science. The materiel field is the application of tools, methods and paradigms from computer science on questions of sport science as well as the integration of sport scientific knowledge in computer science."

CONCLUSION:

*Information Technology and its influence on Sports- Sports Informatics*is certainly anall-inclusive collection of foundation principles relevant to all sports informatics practitioners and students. It also provides an excellent resource for seasoned researchers in sports science who want to probe into the exciting and fast-moving sports analytics domain. Sport represents a domain that is complex enough to be interesting to computer and data science researchers, but it is by no means simple. Indeed, powerful recent discoveries in artificial intelligence are only just starting scratch the surface of the rich array of insight possible in modern sports. Nevertheless, even the most complex mathematical models must still be predicated on sound basic science, and each chapter contributes to a thorough framework of understanding woven from a mix of research and practice. Certainly, it is the main work task for the Information Technology-in-sports to make certain, that a check-up of the given forecast maybe on a convention of the International Association on Computer Science in Sport - will be as successful as possible. As scientific progress in this area is closely connected to technological progress, sports science is well advised to monitor developments and to integrate partners from information technology into its own research activities.

REFERENCES:

Baca, A. (2015). *Information technology in Sport: Research and Practice*. London and New York: Routledge.

Boisot, M. (1972). Discipline and interdisciplinarity. In OECD (Ed.), Interdisciplinarity: Problems of Teaching and Research in Universities (pp. 89-97). Centre for Educational Research and Innovation (CERI). Paris: OECD Publications.

Heckhausen, H. (1972). Discipline and Interdisciplinarity. In OECD (Ed.), Interdisciplinarity: Problems of Teaching and Research in Universities (pp. 83-89). Centre for Educational Research and Innovation (CERI). Paris: OECD Publications.

Karpathy, A., Toderici, G., Shetty, S., Leung, T., Sukthankar, R., & Fei-Fei, L. (2014) Large-*scale Video Classification with Convolutional Neural Networks*. In Proceedings of International Computer Vision and Pattern Recognition (CVPR 2014).

Lames, M. (2008). Coaching and Computer Science. In P.Dabnichki& A. Baca (Eds.), Computers in Sport (S. 99-120). WITPress: Southhampton.

Memmert, D., & Perl, J. (2009). Game creativity analysis using neural networks. *Journal of Sports Sciences, 27*(2), 139-149.

OECD (Ed.)(1972). Interdisciplinarity: Problems of Teaching and Research in Universities. Centre for Educational Research and Innovation (CERI). Paris: OECD Publications

Silva, A. J., Costa, A. M., Oliveira, P. M., Reis, V. M., Saavedra, J., Perl, J., &Marinho, D. A. (2007). The use of neural network technology to model swimming performance. *Journal of Sports Science and Medicine, 6*(1), 117-125.

Yue, Y., Lucey, P., Carr, P., Bialkowski, A., & Matthews, I. (2014).*Learning Fine-Grained Spatial Models for Dynamic Sports Play Prediction*. In 2014 IEEE International Conference on Data Mining, Shenzhen, pp. 670-679.

Yue-Hei Ng, J., Hausknecht, M., Vijayanarasimhan, S., Vinyals, O., Monga, R., &Toderici, G. (2015). *Beyond Short Snippets: Deep Networks for Video Classification*. In Proceedings of International Computer Vision and Pattern Recognition (CVPR 2015). pp. 4694-4702.