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## Influence of Technology on Sports: A Policy Based Perspective

INFLUENCE OF TECHNOLOGY ON SPORTS: A POLICY BASED PERSPECTIVE

by

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Abstract

*Through the years, technology has not only impacted sports but also nourished it. Irrespective of this crucial impact, it has invariably influenced sports both positively and negatively. Positive, in the sense that, with the aid of technology, sports can now be made more efficient or quantifiable. On the contrary, the negative influence is witnessed in the form of cheating, where the spirit of the game can inevitably be lost. This paper seeks to elucidate both these influences, predominantly by analysing and inspecting such recent technologies. To be precise, the author would be testing the impact of such technologies through a legal analysis i.e. determining whether the implemented technology is well regulated by legislation or not. In addition to the critical issues of data protection and doping, powerful technologies of wearables, Biological Passports, LZR swimsuits, Prostheses, and even Hypoxic Environments, have been elucidated and debated upon, all with the objective to prove that there might exist a phase lag between technology and its controlling legislations.*

## INTRODUCTION

Famous Major Baseball league player, Tommy Lasorda, in relation to sports once quoted, "The difference between the impossible and the possible lies in a person's determination." Fascinatingly, another tool that can bridge this gap between the impossible and possible is science and technology. Yes, technology has played a massive role in the evolution of sports since its inception. Ranging from the 'Photo Finish', 'Electronic scoring'<sup>1</sup> and 'instant replays' to the modern inventions of Goal-line technology, Athlete Biological passports



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and wearable devices,<sup>2</sup> technology has been integrated with sports, simply to improve it.

When we talk about the impact of technology, we refer to the improved performances of professionals, via materials such as fiberglass, carbon-fibre and polyurethane.<sup>3</sup> (Fiberglass was implemented in the pole vault and javelin, carbon-fib made the hull in ship-sailing competitions light and stiff, whilst polyurethane had replaced the stiff leather footballs). When we emphasize upon new technology, we refer to those Speedo LZR swimsuits that overwrote 43 swimming world records in a matter of eight days.<sup>4</sup>

Sports have embraced technology as a boon and will continue to do so. But to what extent should it be benefitted from, until it becomes a detriment to sports, is an epiphanic question. Fortunately, there are legislations in place to curb the downfalls of technology. Therefore, this paper deliberates on the influence of technology over sports by analysing the suitability and nature of such legislations. The ultimate objective being, to determine whether there is a phase lag between the technologies utilized and its overseeing legislations.

The first section of this paper would not only entail the legal intricacies of the popular National Football League (hereinafter 'NFL') wearable devices but also analyse data protection legislations in the United States (hereinafter 'US'), United Kingdom (hereinafter

'UK') and India. Further, it would deliberate upon the recent European data protection standards set by the General Data Protection Regulation (hereinafter 'GDPR') in 2018. The second section focuses on the 'Athlete Biological Passport' as a peculiar scientific technology, with the help of high-profile doping cases. Finally, the last section of the paper deals with the legality of sport enhancing inventions as seen in Swimming, Cycling, Golf, Paralympics and other high endurance sports.

#### WEARABLE TECHNOLOGY AND DATA PROTECTION

Technology has played a crucial role in the life of the common man, as seen from the 'wearable' industry. For the past couple of years, performance analysis software has been superimposed with the evolution of wearable technology, in the form of a medical tool, coaching tool and a fitness tool. The idea of the 'quantified self' movement i.e. monitoring personal data through



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the use of technology has resulted in the growth of this tech industry, thereby, enticing consumers from both ends of the spectrum, i.e. the fitness/health enthusiasts and the professional athletes.<sup>5</sup> From a numbers perspective, this booming industry is expected to be worth over USD 53 billion by the end of 2019.<sup>6</sup>

#### NFL Wearable Technology

Aside from the fact that advanced sports teams implement wearable technology to enhance player performance, this technology also helps as a medical aid and prevents injury through data analysis. Its application is clearly seen in the National Football League and other various Rugby clubs in the form of Athlete Biometric Data (hereinafter 'ABD'). For example, in 2015, the NFL had partnered with Zebra Technologies in analysing such Athlete Biometric Data in order to capture each athlete's acceleration rate and distance covered by the player.<sup>7</sup> In addition, the impact sensors worn behind the ear lobe recorded the data and calculated the extent of any injury to the head.<sup>8</sup> These impact sensors were developed to specifically measure concussions to the brain.<sup>9</sup>

Apart from detecting minute changes in a player's performance, they predict the longevity of the player on the pitch.<sup>10</sup> This type of data is unique and dangerous because a player might see a decrease in his pay on macro factors such as age, prior sustained injuries and other biometric data. Therefore, NFL players have constantly stressed upon their absolute ownership over such personal data.



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#### Data Protection Legislations in the US, UK and India

##### *United States*

Unsurprisingly, the technology behind ABD has a massive backdrop in terms of its legal aspects. There are currently no existing laws or legislations in the US which directly address the legal challenges posed by ABD. It is also not certain, as to who owns such biometric data. However, most certainly, if biometric data were to be available in the public domain, the usage of such data by third parties in the US would be constitutionally protected under the First Amendment of the US Constitution. This was held in *CBC Distribution and Marketing Inc v. Major League Baseball Advanced Media, LP*.<sup>11</sup>

There are certain federal laws and independent State laws which protect data in the

United States. Among various federal data protection laws such as the Driver's Privacy Protection Act 1994, Video Privacy Protection Act, Controlling the Assault of Non-Solicited Pornography and Marketing Act, or the Fair and Accurate Credit Transactions Act, the closest ones related to sports data are the Health Insurance Portability and Accountability Act, 1996 (hereinafter 'HIPAA, 1996') and the Federal Trade Commission Act (hereinafter 'FTC Act'). The HIPAA<sup>12</sup> protects the transmission of data of a healthcare facility and applies to any person or institution involved with the use of such healthcare data.<sup>13</sup> Thus, injury-based data generated from the players would come under the ambit of this legislation. Whereas, under the FTC Act<sup>14</sup>, the Federal Trade Commission aids as a *de facto* Data Protection Authority in the US<sup>15</sup> by enforcing data protection regulations on companies (*data processors*) that fail to adopt reasonable security measures. Therefore, any company which deals or handles sports biometric data for any purpose, or in any form, would be regulated by the Commission under this broad legislation.

As far as State laws are concerned, the law of privacy is incorporated into the respective Constitutions of the fifty States. Recently, in 2018, all these States had each enacted breach notification laws, that compelled the implementation of certain security requirements and notification of consumers if



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personal information were compromised.<sup>16</sup> More importantly, some of these State legislations have expanded the definition of 'personal information'.<sup>17</sup> The California Consumer Privacy Act, which would come into effect in 2020, provides protection to biometric information, identifiers, geological data, audio, electrical, thermal or olfactory information, among others.<sup>18</sup> This Act is deemed to be the strictest local data protection regime within the country.<sup>19</sup> Another popular legal enactment is Colorado's 'House Bill 1128'<sup>20</sup>, which ensures the compliance of reasonable security procedures and practices, by third parties who process data on behalf of other entities.<sup>21</sup> Therefore, third party organizations handling sports data would be mandated to comply with firm data protection practices.

Other than data protection rights, biometric data also attracts concerns relating to intellectual property and Publicity.<sup>22</sup> Often, athlete data is defined as a 'right' belonging to an athlete, under NFL player contracts. Based on such contracts, the athlete data may then be used by the National Football League Players Association (hereinafter 'NFLPA') and the NFL in nexus with products, services, marketing etc. Therefore, ABD contracts must be well defined, transparent and explanatory while giving due consideration to the rights of athletes, leagues, teams, and their sponsors.

Conclusively, wearable technology in the US still suffers from discrepancies. Despite the presence of legislations, data of professional sports persons or enthusiasts cannot be deemed to be completely protected. The gravity of the situation is alarming because technology has been developed to quantify an individual's distance, speed, temperature, heart rate, sleep patterns and calorie intake.<sup>23</sup> Another instance is the recent 'Google Glass', a wearable embraced by



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sportspersons across the globe.<sup>24</sup> It has the ability to capture, share and archive anything heard or seen by the smart glass user. Therefore, there is a danger of unsolicited image sharing which inevitably violates privacy rights vis a vis internet enabling devices.<sup>25</sup>

### *United Kingdom*

In the United Kingdom, data and information was earlier governed by the Data Protection Act, 1998 (hereinafter 'DPA, 1998').<sup>26</sup> The Act was applicable only when utilized for business purposes or when personal information is processed by organizations (sporting organizations); but not when used in personal capacity.<sup>27</sup> Further, the DPA, 1998 mainly directed its wordings upon three categories of persons—

First, the 'data controller'; one who directs the purpose and the manner with which the data is processed;

Second, the 'data processor'; normally a third party which processes the data on behalf of the controller;

Third, the 'data subject'; the athlete or the individual, who is the subject of the personal data.<sup>28</sup>

The DPA, 1998 had 6 principles that were very closely related to athletic and sports data in schedule 1 of the Act.<sup>29</sup> First, 'consent'; the consent of the data subject (the athlete) prior to data collection is to be taken into consideration with the help of agreements. Second, 'awareness'; the data subject must be made aware of the specific purpose of the use of such data and that the application of such data outside the specified purpose is strictly prohibited. Third, 'personal data must be up to date'; the data must be updated and accurate else likely to lead to liability of the data processor and subject. Fourth, 'time period'; personal data must not be retained for a time period longer than needed. This personal data was collected in the anticipation of a one-off event and therefore it should not extend the necessary time limit. Fifth, 'precautionary measures', appropriate measures should be taken such as adequate back-ups of the data. Security of the data is important; therefore, there should be succinct procedures and penalties for the violation of the same. Last, 'information' in the form of data must not be transferred outside of the UK, unless the recipient country has an equivalent level of data protection standards or safeguards.<sup>30</sup>



Let us take an illustration to explain the principles of data protection better; the German National Football team (*Die Mannschaft*). In 2014, they had implemented the Adidas miCoach system into their practice and training sessions for their World Cup preparations.<sup>31</sup> It is an advanced physiological monitoring system which includes a small player cell device worn by the players. Not only did it have additional heart beat sensors but also iPads connected to it. The coaches along with the performance innovation team at EXOS and Adidas, used this technology for in depth analysis.

Now, a player (say Thomas Mueller) has specific rights over his personal data. He must be aware as to why and where the data is being used; whether it is for performance analysis purposes, development of injury prevention techniques or marketing aids. Apart from this, he has the right to even request the data controller to correct any inaccuracy. This is because it could potentially influence team selectors in the wrong way. Adidas and EXOS are the third parties i.e. the data processors, whereas the German National Football team is the data controller.

Certainly, a major concern was the ownership of this personal data and its manipulation rights. However, the bigger unanswered question was, as to what extent these third parties could use the personal data of the players which includes sensitive data like health, sex life, religious beliefs, etc.<sup>32</sup>

With the growth of technology, employment contracts and ancillary agreements between the players and their respective clubs are becoming more important. The drafting

of key provisions is crucial, for example, third party ties which require data to be entered with device manufacturers, broadcasters, sponsors and other anonymous organizations. So much is the advancement in the tech world that these wearables have the capacity to store personal data in the cloud<sup>33</sup> as well as smartphones. Therefore, an organization or party borrowing this data must also be well informed about the laws and provisions governing such obligations.

Fortunately, to regulate such hi-tech data<sup>34</sup> and enhance security standards in cases of third-party 'data processors' within the UK, the Act was recently



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replaced by the more competent Data Protection Act, 2018 (hereinafter 'DPA, 2018').<sup>35</sup> UK, still being a part of the European Union, is under the ambit of the new GDPR. In order to complement the new mandated standard, most of the enacted DPA, 2018, is subject to the GDPR.<sup>36</sup> Apart from mirroring characteristics and principles of the GDPR, like 'Rights of the data subject'<sup>37</sup> or 'Obligations of the Controller and Processor'<sup>38</sup>, a unique feature of the Act is seen under s. 199.<sup>39</sup> The provision provides for the recordability of offences committed under the Act in the National Police Records, such as s.170 (unlawful obtaining of data without consent of the Controller)<sup>40</sup>, s.171 (re-identifying de-identified personal data)<sup>41</sup> or s.173 (alteration of personal data by controller or processor)<sup>42</sup>, among others. Hence, it is ensured that all personal data is, and can be regulated by the DPA, 2018 within the UK.

### India

On the concept of data protection or in a broader term, 'Privacy', Indian Jurisprudence has only developed recently. Earlier, the authoritative decisions of *MP Sharma v. Satish Chandra*<sup>43</sup> and *Kharak Singh v. State of UP*<sup>44</sup> had negated privacy as a fundamental right because it was not expressly provided in the Constitution. This was followed by *Maneka Gandhi v. Union of India*,<sup>45</sup> where the Supreme Court applied the 'Integral Part Test' to ascertain that the right to privacy did not form an integral part of the fundamental right of 'personal liberty', in order to be constituted as a fundamental one. In 2017, the Supreme Court in *KS Puttaswamy v. Union of India*, has finally declared the right to be a fundamental one and simultaneously emphasized that "only comprehensive data protection legislation can effectively address concerns of data protection and privacy".<sup>46</sup> In the following year, the Apex Court, in *Navtej Singh Johar v. Union of India*, held privacy to be a 'concept of identity' which "is not only sacred but is also in recognition of the quintessential facet of humanity in person's nature"<sup>47</sup> and thereby decriminalized s. 377 of the Penal Code, 1860.



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As far as Indian legislations are concerned, the Information Technology Act and its prescribed Rules govern data protection concerns. Initially, the country had no direct laws governing personal data. Therefore, the Courts had interpreted 'data protection' within the ambit of right to privacy governed by both, Article 19<sup>48</sup> and 21<sup>49</sup> of the Indian Constitution. Furthermore, s. 43A<sup>50</sup> of the amended Information Technology Act states, "Where a body corporate, possessing, dealing or handling any sensitive personal data or information in a computer resource which it owns, controls or operates, is negligent in implementing and maintaining reasonable security practices and procedures and thereby causes wrongful loss or wrongful gain to any person, such body corporate shall be liable to pay damages by way

of compensation to the person so affected". Further, s. 72A of the same Act incurs liability, in cases of disclosure of information in breach of the sanctity of contracts.<sup>51</sup> In 2011, following stringent laws of Europe on data protection<sup>52</sup>, the Government of India enacted a new regulation namely, the Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011. These Rules specifically ascertain biometric information, sexual orientation, medical record and history and other pertinent contractual information, as "*sensitive personal data*".<sup>53</sup> In strict juxtaposition, these Rules contain similar principles of UK's DPA, 1998; thus encouraging the amalgamation of technology and sport in India.

GDPR: The new standard for Data Protection

Recently, on the 25<sup>th</sup> of May 2018, the European Union brought the GDPR into force. This standardized uniform legislation focuses on five key aspects namely transparency, express consent, governance, data processing, and enforcement.<sup>54</sup> Article 13 and 14 of the GDPR mandates that concerned bodies must inform the subject about the purpose and future intentions of processing his data. Further, in the name of transparency, Article 5 provides that the information processed must be easily accessible and comprehensible.<sup>55</sup>

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Nevertheless, the pinnacle of this legislation can be seen in its active consent-based model. As per Recital 42<sup>56</sup>, free consent is presumed not to be given where the data subject has no genuine choice and cannot withdraw consent without detriment. However, there might have been a problem with the absolute right of consent given to the athlete, where the athlete can easily withhold consent in cases of anti-doping and integrity reinforcement. Effectively, the GDPR has carved an exception for public authorities under Article 9 (sports bodies do fall within this ambit because it performs integrity functions in the name of public interest).<sup>57</sup>

Apart from increasing the accountability and responsibility of organizations or third-party processors, the legislation has provided for strict compliance by enforcing strict penalties and sanctions. Article 83(5) of the GDPR<sup>58</sup> could be invoked for fines of as much as 4% of the annual turnover of the body/company or 20 Million Euros, whichever is higher. Despite the efforts of the European Union Parliament, there has been an ignorant attitude towards the regulation by sporting organizations, according to a GDPR readiness survey.<sup>59</sup> Not only were 84% of sports organizations unaware of the implications of the GDPR, but a staggering 80% of such organizations did not appoint a Data Protection Officer (hereinafter 'DPO').<sup>60</sup> Nonetheless, the strong enforcement regime should keep these organizations active on the sacred principles of data protection.

Lacunae or Concerns Among the Three Jurisdictions of US, UK, and India

For a critical analysis of the American and Indian Jurisprudence on data protection, it must be scrutinized with respect to the GDPR, which embodies international standards of securities and practices. Federal and State legislations in the US only apply general focus on the security of data, and lack European principles of data security, such as transparency, lawful basis for processing, purpose limitation, data minimization, proportionality and retention<sup>61</sup>. Further, rights of data subjects are absent or limited. For example, the right to rectify errors, the right to restrict processing or the right to register complaints with relevant data protection authorities is unaddressed.

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Additionally, only specific legislations like the Gramm Leach Bliley Act, HIPAA and the Massachusetts Data Security Regulation provide for the appointment of a DPO, which is an essential requirement under International standards.<sup>62</sup>

Similarly, the Information Technology Act and its Rules in India are underdeveloped compared to the European Regulation. Neither are specific rights of the data subjects explained nor are obligations of data controllers and processors enumerated. Likewise, there is no obligation mandated for the appointment of DPO. The main reason behind the premature legislation is the slow realization of the right to privacy within Indian jurisprudence.

Under the aegis of the GDPR, United Kingdom's prime data legislation clearly maintains admirable international standards. However, there *prima facie* exist few evident concerns within the legislation. First, under Schedule I, para 22 of the DPA, 2018<sup>63</sup> political parties are permitted to process personal data and profile their 'revealed political opinions', without the data-subject's consent. This could eventually lead to the abuse of powers by parties, under the name of political activities. Second, under s. 27, the Minister of the Crown can exempt the compliance of various important rights and duties of the Act, for the purposes of national security or defence, by issuing a 'National Security Certificate'.<sup>64</sup> This could go against the spirit of the GDPR and the 2018 DPA, 1998, which is to protect personal data and personal liberty.

Who is The Owner of Personal Data?

The inevitable problem with data storing technology is the identification of the owner of such data; whether it is the athlete, the data controlling organization, the data processing organization, or other third parties.

'Ownership' is defined as the exclusive right to use, possess, and dispose-off the property, subject only to the rights of persons having a superior interest and to any restrictions on the owner's rights imposed by an agreement with or by an act of third parties, or by operation of law.<sup>65</sup> Although personal data can be brought within the ambit of personal property, it is still difficult to identify the owner of personal data with certainty. This is mainly because regulations like the GDPR, fail to directly express any exclusive ownership rights over such data<sup>66</sup> and simply define the role of data-subjects, data controllers, and



data processors. Therefore, one cannot ascertain either of the three as ultimate owners of the data.

Under the GDPR, data-subjects have innumerable exclusive rights over their data, such as, the right of access to personal data<sup>67</sup>, the right to rectify data<sup>68</sup>, the right to erasure<sup>69</sup>, the right to restriction of processing<sup>70</sup>, the right to data portability<sup>71</sup> and the right to object<sup>72</sup>, amongst others. However, these rights are subject to restrictions in Article 23, like in clause (g); "*the prevention, investigation, detection and prosecution of breaches of ethics for regulated professions*".<sup>73</sup> Therefore, when it comes to ethical conduct or breaches by sportspersons, the concerned sporting authority (a supposed data controller) could have rights over this data and send it for further processing. However, merely doing this does not give ownership rights to the 'Controller' because its role is limited to determining the purpose for which and the means by which personal data is to be processed.<sup>74</sup>

Alternatively, data processors can also be deemed as the owner of personal data. The German Nuremberg Court<sup>75</sup> in 2012, had endorsed the "*Skripturakt*" theory which proposed that the person who generates the data gets the right to the data, irrespective of whom it is generated for. In addition, s. 950 of the German Civil Code<sup>76</sup> provides that, "A

*person who, by processing or transformation of one or more substances, creates a new movable thing acquires the ownership of the new thing, except where the value of the processing or the transformation is substantially less than the value of the substance. Processing also includes writing, drawing, painting, printing, engraving or a similar processing of the surface".* Therefore, according to German laws, it can be inferred that data processors can also claim ownership over the personal data it generates and processes for the data controller.

In the author's opinion, since data protection has a consent-based mechanism and that the data subject has the right to be forgotten (complete erasure of data)<sup>77</sup>, the data subject is relatively the owner of his personal data, albeit with restrictions. The data controller, on the other hand, only acts as an agent of the



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data-subject by managing such data. Significantly, the ownership of the data from the processor's point of view would depend on the type of data it generates. If the data generated comes within the definition of "*sensitive or personal data*", the data subject would be its owner. However, in other cases, the processor would be the owner. For example, if based on the personal injury details of several hockey players, the data processor generates a statistic for the entire group, with the consent of those hockey players, then the data generated would be property of the data processor. Simply because it would not fall under the ambit of sensitive or personal information vis a vis the players.

#### Fitbit Data and the way forward

Certainly, the age of wearables and hi-tech data has incorporated a new chapter in the textbook of law. For example, wearable technology has been very helpful to the Courts in the form of reliable evidence. Like in a case of a woman who claimed herself raped at night, her Fitbit data indicated that she was awake all night.<sup>78</sup> Hence, she was charged for tampering evidence and filing false reports. Another example was also seen where a Canadian woman's physical activity was detected following her car accident and such Fitbit technology are being used as evidence.<sup>79</sup> This very personal injury lawsuit had set up Fitbit health trackers as a precedent.<sup>80</sup>

Regulating such data would be a serious task, but not an impossible one. The GDPR has set new inspiring international standards and furthers the objective of securing fundamental freedoms of natural persons.<sup>81</sup> But most importantly, under Article 45(1), it mandates third world countries and international organizations to adopt similar standards of data protection for an inter-transfer of personal data. Therefore, in response, UK had enacted the DPA, 2018 while India has the Personal Data Protection Bill, 2018 ready for enactment.<sup>82</sup> Under the recommendations of the Srikrishna Committee, the Bill has borrowed principles of the GDPR and enlisted fines greater than five crores or fifteen crores against the data fiduciary<sup>83</sup> (data collector), with respect to categorized breaches.



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#### ATHLETE BIOLOGICAL PASSPORT AND DOPING

As an independent governing body, World Anti-Doping Agency's (hereinafter 'WADA') goal is to 'promote, coordinate, and monitor' the fight against doping in all forms of sports.<sup>84</sup> Before the introduction of the biological passport, players were kept in check



through direct medical tests.<sup>85</sup> There existed the 'no start rule' which aimed at preventing athletes from competing if their haemoglobin levels crossed the stipulated limits.<sup>86</sup> The rule was then followed by a more advanced method of detecting doping, i.e. through the Athlete Biological Passport.

When compared to the traditional methods of detecting doping, the Athlete Biological Passport monitors selected variables that reveal the effects of doping, over time.<sup>87</sup> To be more precise and technical, the principle is based on Bayesian networks through a mathematical formalism inferred from probabilities shown on a graph.<sup>88</sup> That itself is modern day technology.

To eliminate problems in relation to the safety of sensitive biological/medical data of tested athletes, the WADA has a well-designed code, i.e. the International Standard for the Protection of Privacy and Personal Information (hereinafter 'ISPPPI'). The ISPPPI Code recognizes privacy rights of sportspersons and ensures protection of the same.<sup>89</sup> This International Standard provides mandatory rules and standards relating to the protection of Personal Information by Anti-Doping Organizations.<sup>90</sup> The usual norm of securing, processing, disclosure, retaining and handling of personal data has also been enlisted into the Standard. However, the main highlight of the Code is that, in order to coordinate the distribution of tests and avoid unnecessary duplication of test samples by various anti-doping organizations, each organization shall



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report all 'In-Competition and Out-of Competition' tests on such Athletes to the WADA Clearing house as soon as possible.<sup>91</sup>

#### High Profile Doping Cases

The Court of Arbitration for Sport (hereinafter 'CAS') has treated Athlete Biological Passports as reliable means to prove doping.<sup>92</sup> There have been many successful cases in which these passports have been used as evidence. High profile sportspersons such as German speed skater Claudia Pechstein (2009), Russian cyclist Denis Menchov (2010), Russian walker Igor Yerokhin (2013), Portuguese marathon runner Helder Ornelas and the legendary US cyclist Lance Armstrong, were all caught for doping with the help of their respective 'Athletic Biological Passports'.<sup>93</sup>

However, there have been some stellar cases where the defence has tried to prove discrepancies within the biological passport. In 2014, former cyclist Jonathan Tiernan-Locke was given a two-year ban by the United Kingdom Anti-Doping (hereinafter 'UKAD') for the manipulation of 'Erythropoietin' in his own system.<sup>94</sup> His defence contended that a binge drinking session followed by a period of dehydration majorly contributed to the "*wildly abnormal*" readings. Yet, the National Anti-Doping Tribunal<sup>95</sup> had held that the report submitted by the defence did not substantiate as to how alcohol increased haemoglobin levels. Further, the assumption of dehydration also being a factor of such readings was not proved by evidence. Hence, the three-man panel stripped him off the 'Tour of Britain' title.<sup>96</sup>

A more controversial case was that of the Italian cyclist Franco Pellizotti in 2011.<sup>97</sup> His defence team had argued before the Italian Anti-Doping Tribunal that, the blood variations in the biological passport were due to altitude training and were not significant enough to prove his guilt.<sup>98</sup> The Italian Tribunal had adjudged the defendant innocent, but on an appeal to the CAS by the



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Union Cycliste Internationale (hereinafter 'UCI'), he was penalized with a two-year ban.<sup>99</sup> And finally, the infamous case of superstar cyclist Alberto Contador illustrates the excuse of inadvertent doping. The defence claimed that he had consumed contaminated beef but the tribunal had opined that the positive test of 'clenbuterol' was due to contaminated food supplements.<sup>100</sup> Therefore, based on the fact that other members of the Astana team (to whom the same supplements were provided) did not test positive, the CAS ruthlessly banned him.<sup>101</sup>

## LEGALITY OF SPORT ENHANCING TECHNOLOGIES

### Swimwear

The most influential sports equipment within sporting history, in terms of technology, is Swimwear. Prior to the Beijing Olympics of 2008, Speedo with the help of National Aeronautics and Space Administration (hereinafter 'NASA') had developed a swimwear called the Speedo LZR Racer swimsuit.<sup>102</sup> The design was tested in a NASA wind tunnel and tested through advanced computational models.<sup>103</sup> Swimmers who embraced this suit broke 23 out of 25 records in the 2008 Olympics.<sup>104</sup> The Hi-tech suit attracted more controversy when 43 new world records were broken, during the eight-day FINA World Championships (2009) by athletes wearing the same swimsuit.<sup>105</sup> In a span of 23 months and by the end of 2009, a staggering 255 new records were set.<sup>106</sup> To exemplify the impact of this technology, we take the example of Russian great Alex Popov who held the 100m freestyle record for a decade. The new swimsuit technology was so powerful that by the end of 2009, he was not even ranked in the top 100.<sup>107</sup>



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The polyurethane swimsuit fit the whole body from shoulder to calf and was designed to optimize body compression and hydrodynamics.<sup>108</sup> In comprehensible terms, it was built to reduce swimmer's viscous drag, supply adequate oxygen to the muscles and trap air in order to add to the buoyancy.<sup>109</sup> Actually, these polyurethane suits were legalized in 1999, when *Fédération internationale de natation* (hereinafter 'FINA') approved the "*Full Bodysuit*" and the "*Long John suit*"; manufactured by Adidas and Speedo respectively.<sup>110</sup> However, there was a FINA rule (SW 10.8) which prevented the use of devices which could enhance the swimmers' speed, buoyancy, or endurance during competitions (such as webbed gloves, flippers, fins, etc.).<sup>111</sup> However, FINA did not interpret those swimsuits as any of the above mentioned devices; thus the legalization of the suits. Ultimately, following the rise of technology, FINA adopted the "*Dubai Charter on FINA requirements for swimwear approval*" within which Section 1.b.ii specified that the materials of the swimwear should not create any air trapping effects.<sup>112</sup> Therefore, the LZR suit was banned. In fact, in *Amaury Leveaux & Aurore Mongel v. Fédération Internationale de Natation*, the appellants tried to arbitrate for their swimwear, before the CAS.<sup>113</sup> Unsurprisingly, along with their Tracer B8 suit, the other competitor's polyurethane suits were also banned.<sup>114</sup>

### MOTORIZED DOPING

Cycling has also been revolutionized by technology to the extent that performances improved by 221% in a span of eleven years with the help of new Hi-tech bikes.<sup>115</sup> In addition to the transition from the original metal frames to the carbon fibre ones, the new bikes have Bluetooth integrated GPS systems, electronic gears, power meters, etc.<sup>116</sup> Nonetheless, with technology, came the evil of 'motorized doping'. The jargon first surfaced when David Cassani



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accused Fabian Cancellara in 2010, of riding with a motor in his frame.<sup>117</sup> Then, when Ryder Hesjedal's bike was spinning on the ground, whilst on the ground, during the 2014 Vuelta a España, the UCI took clear note of the jargon and investigated it.<sup>118</sup> Ultimately, motorized doping came to light in public when a spare bike of Femke Van den Driessche at the U23 Cyclo-cross World Championships (2016) was discovered to contain a 'Vivax Assist' motor.<sup>119</sup> Not only did the UCI ban her for six months but also fined her 50,000 Euros.<sup>120</sup> Article 1.3.010 of the 'Clarification guide of the UCI technical regulation' clearly stated that the bicycle should not be propelled by any electric assistance.<sup>121</sup> Therefore, the motors that powered the bracket axle to move the pedals were banned.

In order to restrict the applications of technology in cycling, the UCI had produced the Lugano Charter which basically aimed to maintain constant efficiency in the bikes.<sup>122</sup> This was done to prevent technology from helping the current day riders in breaking old records. Once, a British cyclist Graeme Obree had developed a cycle made from washing machine parts, such that he could generate excess power through his thighs.<sup>123</sup> He even invented a 'superman' position to aerodynamically support him.<sup>124</sup> Unfortunately for him, the UCI also banned these two innovations.<sup>125</sup>

#### Rugby Gear

In addition to the earlier discussed impact sensors for rugby players, smaller rugby leagues and junior leagues decided to use extra padded helmets for precautionary and preventive measures. A product called the 'Guardian Cap' was introduced to reduce head impacts up to 33%.<sup>126</sup> It had compartments fitted



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with extra foam, which dissipated more energy compared to the solid shells. Unfortunately, the caps could not gain validity because of its non-compliance with the National Operating Committee on Standards for Athletic Equipment (hereinafter 'NOCSAE'). The NOCSAE was of the view that any addition to the helmet that alters the protective system, through extra padding, would change the geometry of the helmet and increase its weight.<sup>127</sup> In 2012, Unequal Technologies had introduced the 'Unequal Dome' which contained a padded skull cap. After NOCSAE testing, it was highly recommended by doctors for high risk players who require proactive protection.<sup>128</sup>

#### Golf and Technology

With golf and technology, we refer to the high-profile case of professional American golfer, Casey Martin, who suffered from a left leg circular disorder known as Klippel-Trenaunay-Webber syndrome.<sup>129</sup> He was required to move around in a buggy (motorized car) in between his shots. The US Professional Golf Association decided to ban the technology, citing that it gave him an unfair advantage over the other golfers and that it changed the nature of the game.<sup>130</sup> However, the Supreme Court of the US overruled the association's decision by stating that the use of the buggy did not alter the nature of the game, as it was not a fundamental part of the sport.<sup>131</sup>

The golf ball has been altered many times down the years. First, it took its transition from the old traditional 'guttapercha' ball to the rubber one which had more flight.<sup>132</sup> Obviously, the professionals who were skilled with the old ball protested the move to replace the same. Decades later, the Polara golf<sup>133</sup> was introduced whose surface had a dimple pattern. It reduced the ball from being hooked or sliced, hence, benefitting the amateur players. For that very



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reason it was banned. Another banned technology were the golf club heads, which were shaped in 'U' or square grooves.<sup>134</sup> This innovation changed the traditional and typical nature of the sport by reducing the skill to play it.

#### Prostheses for Paralympians

The most unique technology that was introduced in the field of athletics, was the 'prostheses'. The famous Paralympian, Oscar Pistorius, used lower limb prostheses made of carbon fibre during his events.<sup>135</sup> His skill and strength combined with the technology made him a strong contender for the 400 m in the Beijing Olympics (2008). But the conundrum lied in whether he would be at an advantage compared to fully able bodies. Adding to that, in 2007 the International Association of Athletics Federations (hereinafter 'IAAF') Rule 144.2 forbade the usage of any technological device that 'incorporated springs, wheels or any other element' and which gave an unfair advantage over other competitors.<sup>136</sup> The IAAF conducted tests on Oscar Pistorius and five other able athletes and compared them with the help of the expert Dr. Brüggemann. The tests concluded that the prostheses when juxtaposed with normal leg strength, gave a mechanical advantage<sup>137</sup> of 30%, thus yielding a 25% lower oxygen uptake by the athlete bearing the prosthetic technology.<sup>138</sup> Taking this Cologne Report into consideration, the IAAF banned Oscar Pistorius from the Beijing Olympics.

Eventually, Oscar appealed to the CAS citing his right to run in the Olympics. The CAS ultimately ruled in his favour for four main reasons.<sup>139</sup> First, the Cologne report was only based on the part where the appellant ran the fastest, and not the overall race. The report excluded the slow start and the acceleration phase of Mr. Pistorius, which created a distorted view. Second, Dr. Brüggemann was not made known of his role by the IAAF. He was not told that the report was to determine the advantages and disadvantages of the Cheetah Flex Foot Prostheses, and the IAAF submitted an inaccurate summary of the report without the authentication by the Doctor himself. Third, the IAAF did not allow the scientist nominated by the appellant to actively take part in the tests. He was just made an "*observer*" of the proceedings, and, his questions and suggestions were outrightly ignored. And, fourth, the Rule 144.2 was ambiguous. Since there was no solid evidence regarding the advantages of



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the prosthetic technology and considering the low standards of IAAF, the CAS ruled to allow Oscar Pistorius to take part in the London Olympics, 2012.<sup>140</sup>

In 2015, following the Pistorius case, Paralympic long jump master, Markus Rehm decided to force in a similar judgment for himself. However, IAAF's new rules required one to prove that the technology did not give the bearer an unfair advantage. Not only did the prostheses better take off efficiency, but the fact he used his prosthetic leg to jump, added to his advantage.<sup>141</sup>

Another technical and legal aspect regarding the prosthetic technology is the controversial double legged amputee. Unilateral amputees were of the view that the double legged amputees were at an advantage because the latter could easily increase the height of their prostheses.<sup>142</sup> On the contrary, tests and researches did not prove that the bilateral amputees were at an advantage. Also, the bilateral amputees were not in contravention of Article 3.3.2(b) of the International Paralympics Committee's (hereinafter 'IPC') Athletics

rulebook, i.e. unrealistic enhancement of stride length. This issue is still unresolved and in debate because facts like "*Seven of the fastest eight timings in the 200 m and the top six times in the 400 m belong to bilateral amputees*"<sup>143</sup>, speaks volumes.

#### Hypoxic Environments

A much-criticized technology that could be brought within the ambit of sports equipment is the 'Hypoxic Environment'. It is a performance enhancing and an expert administered technology that aims to reduce athlete effort by increasing the efficiency of athletes within difficult environments.<sup>144</sup> The hypoxic artificial environment is an alternative to techniques like altitude training, since the latter leads to side effects such as insomnia, headache, dizziness, hyperventilation, etc.<sup>145</sup> Such environments contain air pressure which corresponds to altitudes ranging from 4000 to 5000 meters, thus helping to



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improve the oxygen carrying capacity of the red blood cells within the body.<sup>146</sup> However, despite the pros, this technology is under debate, as to whether it should be banned by WADA since it can potentially be seen as another form of 'blood doping'.

WADA's criteria for banning Hypoxic environments were<sup>147</sup>: First, it should have the potential to enhance performance; Second, it should have potential health risks to athletes; Third, it should violate the spirit of sport. In relation to the second criteria, it is a fact that an extensive exposure to hypoxia causes epithelial injury, hence, culminating in thrombosis.<sup>148</sup> Therefore, it boils down to the last criteria, as to whether this technology is an ethical one. Can the argument, that "*sport should be based on virtuous perfection of natural talents*", be an important one?<sup>149</sup> Initially, the WADA Ethical Issues Review Panel of 2006 endorsed the same opinion on the ethical issue of the matter but after receiving heavy criticism, the inquiry declined the notion to ban the hypoxic chambers.<sup>150</sup>

On a brief analysis, there were mainly three reasons why there was no violation of the third criteria vis a vis the WADA code. First, if sport was only to be based on natural talent, then artificial heat chambers and weight training facilities would simultaneously be banned. Removal of artificial aids would not only deter the progress of Sport but also act as a detriment to Sports.<sup>151</sup> Second, the Hypoxic machine does not level out natural, inborn or genetic differences between the competitors.<sup>152</sup> Third, the spirit of sport does not signify complete or universal levelling of athletes' circumstances.<sup>153</sup> If that were the case, then athletes living on sea level could file for an injustice. Conclusively, Hypoxic environments are merely Human Enhancement Technologies, and not engineered sporting devices.



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## CONCLUSION

Technology had integrated into Sports as early as 1888, when the Photo Finish was adopted. Not only has technology gathered pace with time but has also added a new dimension to sports. To elucidate, we take the example of video cameras and computers within international sports federations and competitions. Video camera replays and computers assist the adjudicator in determining results and reviewing controversial decisions.<sup>154</sup> Other applications of technology being, the Goal line Technology (Football), 3rd Umpire (Cricket), Hawk Eye electronic line judgment (Tennis), etc.

Despite the typical cynicism towards technology, there is no doubt that it has and will be beneficial to the sports industry. For example, the National Hockey league is planning to implement smart pucks in order to produce live quantified data for the coaches or even sports bettors.<sup>155</sup> Similarly, a technology based company Digilens had recently unveiled Augmented Reality Helmets for bikers to receive real time data and route maps in their field of view.<sup>156</sup> But then again, the scepticism lies in technologies, such as the one recently introduced by the Australian Sports Anti-Doping Authority.<sup>157</sup> They were licensed with a Universal Forensic Extraction Device in order to hack the phones of suspected doping athletes, bye-passing patterns, passwords or Personal Identification Number locks.

There certainly exists a definite phase lag between such growing technologies and its governing legislations. However, legislations such as the GDPR provide us with a good insight on tackling issues of data breach. However, the author is also of the opinion that sports data must be well addressed by a more specific code, like WADA's ISPPPI. Sports data such as personal injury details or quantified statistics of a sportsperson's ability which is processed for the generation of new data differs from other personal data. Further, the ownership of this new data is not addressed in those broader legislations that dictate general data protection. Hence, the need of sport-specific data protection legislations could be significant.



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Furthermore, as inferred from the earlier discussions, technology could potentially destroy the spirit of the sport by altering the nature of the game. Nonetheless, International Federations have done their utmost best to leave no stone unturned. From WADA's data privacy standards to the Lugano Charter of the UCI, legislations have helped in maintaining the essence of the Sport in relation with the rights of the sportspersons. The legal implications of technology in sport are vast and changing with time. Therefore, organizations like IAAF, WADA, UCI, etc. and even more importantly the CAS must be prepared for unprecedented challenges in the near future.

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<sup>1</sup> Shira Springer, 'Brief History of Technology in Sports' (*The Boston Globe*, 4 November 2012) <<http://www.bostonglobe.com/sports/2012/11/03/brief-history-technologysports/GwvgQafARUbW5SG5ep3cyM/story.html>> accessed 1 December 2018.

<sup>2</sup> Tanner Simkins, 'How Wearable Technology Will Change Sports' (*The Motley Fool*, 3 April 2014) <<http://www.fool.com/investing/general/2014/04/03/how-wearable-technology-will-change-sports.aspx>> accessed 3 December 2018.

<sup>3</sup> Technologist, 'The Sports Revolution, Ending the Pain' (*Gaitup*, 4 July 2016) <<http://www.gaitup.com/press/technologist-the-sports-revolution-ending-the-pain/>> accessed 2 December 2018.

<sup>4</sup> Jeff Krushell, 'Doping in Sport' (*Krush Performance*, 18 February 2016) <<http://www.krushperformance.com/krushradio/doping-in-sport/>> accessed 18 December 2018.

<sup>5</sup> Jonny Madill, 'Wearable Tech in Sport: The Legal Implications of Data Collection' (*LawInSport*, 9 April 2015) <<http://www.lawinsport.com/articles/item/wearable-tech-in-sport-the-legal-implications-of-data-collection>> accessed 5 December 2018.

<sup>6</sup> 'Smart Wearables Market to Generate 53 Billion Hardware Revenues by 2019' (*Juniper Research*, 9 September 2014) <[http://www.juniperresearch.com/press/press-releases/smart-wearables-market-to-generate-\\$53bn-hardware](http://www.juniperresearch.com/press/press-releases/smart-wearables-market-to-generate-$53bn-hardware)> accessed 3 December 2018.

<sup>7</sup> Kristy Gale, 'Data Generated by Wearable Tech Presents Many Challenges in Sports' (*SportTechie*, 13 May 2016)

<<http://www.sporttechie.com/data-generated-by-wearable-tech-presents-many-challenges-in-sports/>> accessed 5 December 2018.

<sup>8</sup> Paul Bolton, 'Saracens Take Fight against Concussion to New Level' *The Telegraph* (London, 4 January 2015) <<http://www.telegraph.co.uk/sport/rugbyunion/club/11324385/Saracens-take-fight-against-concussion-to-new-level.html>> accessed 6 December 2018.

<sup>9</sup> *ibid.*

<sup>10</sup> Jared Lindzon, 'Wearable Tech Will Transform Sport — But Will it Also Ruin Athletes' Personal Lives?' (*The Guardian*, 9 August 2015) <<http://www.theguardian.com/technology/2015/aug/09/wearable-technology-sports-athletes-personal-lives>> accessed 6 December 2018.

<sup>11</sup> Jason Cruz, 'Sports and the First Amendment' (2017) 27 *Marquette Sports Law Review* 355, 369.

<sup>12</sup> Health Insurance Portability and Accountability Act 1996, s 3 (USA).

<sup>13</sup> Kayaalp M, 'Patient Privacy in the Era of Big Data' (2017) 35 *Balkan Medical Journal* 8, 12.

<sup>14</sup> Federal Trade Commission Act 2006, s 5 (USA).

<sup>15</sup> Jason Weinstein, 'The US Doesn't Have a National Data Protection Authority? Think Again...' (*International Association of Privacy Professionals*, 16 October 2013) <<http://www.iapp.org/news/a/america-doesnt-have-a-national-data-protection-authority-think-again/>> accessed 6 December 2018.

<sup>16</sup> Jeewon Kim Serrato and others, 'US States Pass Data Protection Laws on the Heels of the GDPR' (*Norton Rose Fulbright*, 9 July 2018) <<http://www.dataprotectionreport.com/2018/07/u-s-states-pass-data-protection-laws-on-the-heels-of-the-gdpr/>> accessed 12 December 2018.

<sup>17</sup> *ibid.*

<sup>18</sup> California Consumer Privacy Act 2018, s 1798, 140 (USA).

<sup>19</sup> Bruce Haring, 'California Enacts Nation's Strictest Data Privacy Law' (*Deadline*, 29 June 2018) <<http://www.deadline.com/2018/06/california-enacts-nations-strictest-data-privacy-law-1202419914/>> accessed 5 December 2018.

<sup>20</sup> Joe Rubino, 'Colorado's New Consumer Data Protection Law Among the Most Demanding in the Country' *The Denver Post* (Colorado, 4 September 2018) <<http://www.denverpost.com/2018/09/04/colorado-businesses-consumer-data-protection-law/>> accessed 5 December 2018.

<sup>21</sup> US House Bill 1128 (2018).

<sup>22</sup> Kristy Gale, '3 Things You Need to Know About How Sports are Impacted by Athlete Biometric Data - Tao of Sports Podcast' (*LinkedIn*, 8 June 2016) <<http://www.linkedin.com/pulse/3-things-you-need-know-how-sports-impacted-athlete-biometric-gale>> accessed 7 December 2018.

<sup>23</sup> Madill (n 51).

<sup>24</sup> John Koetsier, 'Pro Sports First: Tennis Player to Wear Google Glass at Wimbledon This Week' (*Venture Beat*, 20 June 2013) <<http://www.venturebeat.com/2013/06/20/pro-sports-first-tennis-player-to-wear-google-glass-at-wimbledon-this-week/>> accessed 8 December 2018.

<sup>25</sup> Tom Page, 'A Forecast of the Adoption of Wearable Technology' (2015) 6 *IJTD* 12, 25.

<sup>26</sup> Data Protection Act 1998 (UK).

<sup>27</sup> Practical Law Employment, 'Comparisons: DPA 1998 v. GDPR and DPA 2018' (*Practical Law*, 2018) <[https://uk.practicallaw.thomsonreuters.com/w-011-6935?transitionType=Default&contextData=\(sc.Default\)&firstPage=true&comp=pluk&bhpc=1](https://uk.practicallaw.thomsonreuters.com/w-011-6935?transitionType=Default&contextData=(sc.Default)&firstPage=true&comp=pluk&bhpc=1)> accessed 5 December 2018.

<sup>28</sup> Data Protection Act 1998, s 1(1).

<sup>29</sup> Iain Taker, 'Data Protection and Sport — An Uncertain Partnership' (*LawInSport*, 15 February 2012) <<https://www.lawinsport.com/topics/articles/intellectual-property-law/item/data-protection-and-sport-an-uncertain-partnership>> accessed 6 December 2018.

<sup>30</sup> Employment (n 73).

<sup>31</sup> Matthew Hymers, 'How the Adidas miCoach System has Helped Germany in the World Cup' (*SportTechie*, 9 July 2014) <<http://www.sporttechie.com/how-the-adidas-micoach-system-has-helped-germany-in-the-world-cup/>>

accessed 7 December 2018.

<sup>32</sup> *ibid.*

<sup>33</sup> Samuel Gibbs, 'Court Sets Legal Precedent with Evidence from Fitbit Health Tracker' (*The Guardian*, 18 November 2014) <<http://www.theguardian.com/technology/2014/nov/18/court-accepts-data-fitbit-health-tracker>> accessed 5 December 2018.

<sup>34</sup> Elizabeth Denham, 'Beyond 2018 — Data Protection Laws Built to Last' (*Information Commissioner's Office*, 23 May 2018) <<http://www.ico.org.uk/about-the-ico/news-and-events/news-and-blogs/2018/05/beyond-2018-data-protection-laws-built-to-last/>> accessed 7 December 2018.

<sup>35</sup> Data Protection Act 1998.

<sup>36</sup> Data Protection Act 2018, s 1(2).

<sup>37</sup> Data Protection Act 2018, s 3(3).

<sup>38</sup> Data Protection Act 2018, s 4(3).

<sup>39</sup> Data Protection Act 2018, s 199.

<sup>40</sup> Data Protection Act 2018, s 170.

<sup>41</sup> Data Protection Act 2018, s 171.

<sup>42</sup> Data Protection Act 2018, s 173.

<sup>43</sup> AIR 1954 SC 300.

<sup>44</sup> AIR 1963 SC 1295.

<sup>45</sup> (1978) 1 SCC 248.

<sup>46</sup> (2017) 10 SCC 641.

<sup>47</sup> (2018) 1 SCC 791.

<sup>48</sup> Constitution of India, art 19.

<sup>49</sup> Constitution of India, art 21.

<sup>50</sup> The Information Technology Act 2000, s 43(a).

<sup>51</sup> The Information Technology Act 2000, s 72(a).

<sup>52</sup> Vaibhavi Pandey, 'India: Data Protection Laws in India: The Road Ahead' (*Mondaq*, 1 July 2015) <<http://www.mondaq.com/india/x/408602/data+protection/DATA+PROTECTION+LAWS+IN+INDIA+THE+ROAD+AHEAD>> accessed 8 December 2018.

<sup>53</sup> The Information Technology Act 2000, s 3.

<sup>54</sup> Nick Fitzpatrick, 'Data Protection and Sport — The key issues to consider' (2018) 16 WSLR 1, 2.

<sup>55</sup> General Data Protection Regulation 2016, art 5.

<sup>56</sup> General Data Protection Regulation 2016, recital 42.

<sup>57</sup> General Data Protection Regulation 2016, art 9.

<sup>58</sup> General Data Protection Regulation 2016, art 83(5).

<sup>59</sup> Sean Cottrell, 'Results of Sport Sector GDPR Readiness Survey — Data Protection Report' (*LawInSport*, 16 January 2018) <<http://www.lawinsport.com/announcements/item/sport-sector-gdpr-readiness-survey-2018>> accessed 7 December 2018.

<sup>60</sup> *ibid.*

<sup>61</sup> *The International Comparative Legal Guide to: Data Protection 2018* (5th edn, Global Legal Group 2018).

<sup>62</sup> *ibid.*



<sup>63</sup> Data Protection Act 2018, sch I para 22.

<sup>64</sup> Data Protection Act 2018, s 27.

<sup>65</sup> Jonathan Law and Elizabeth A Martin, *A Dictionary of Law* (7th edn, OUP 2014) 239.

<sup>66</sup> Benoit Van Asbroeck, Julien Debussche and Jasmien César, *Building the European Data Economy* (Bird & Bird 2017) 22.

<sup>67</sup> General Data Protection Regulation 2016, art 15.

<sup>68</sup> General Data Protection Regulation 2016, art 16.

<sup>69</sup> General Data Protection Regulation 2016, art 17.

<sup>70</sup> General Data Protection Regulation 2016, art 18.

<sup>71</sup> General Data Protection Regulation 2016, art 20.

<sup>72</sup> General Data Protection Regulation 2016, art 21.

<sup>73</sup> General Data Protection Regulation 2016, art 23(g).

<sup>74</sup> 'What is a Data Controller or a Data Processor?' (*European Commission*) <[http://www.ec.europa.eu/info/law/law-topic/data-protection/reform/rules-business-and-organisations/obligations/controller-processor/what-data-controller-or-data-processor\\_en](http://www.ec.europa.eu/info/law/law-topic/data-protection/reform/rules-business-and-organisations/obligations/controller-processor/what-data-controller-or-data-processor_en)> accessed 9 December 2018.

<sup>75</sup> OLG Nürnberg, 23/01/2013 1 Ws 445/12; Benoit Van Asbroeck (n 112).

<sup>76</sup> Benoit Van Asbroeck (n 112) 28.

<sup>77</sup> General Data Protection Regulation 2016, art 17.

<sup>78</sup> Le Trinh, 'Can Your Fitbit Data Be Used Against You in Court?' (*FindLaw*, 14 July 2015) <<http://www.blogs.findlaw.com/blotter/2015/07/can-your-fitbit-data-be-used-against-you-in-court.html>> accessed 10 December 2018.

<sup>79</sup> Alexandro Alba, 'Police, Attorneys are Using Fitness Trackers as Court Evidence' *Daily News* (New York, 19 April 2016) <<http://www.nydailynews.com/news/national/police-attorneys-fitness-trackers-court-evidence-article-1.2607432>> accessed 8 December 2018.

<sup>80</sup> Gibbs (n 79).

<sup>81</sup> General Data Protection Regulation 2016, art 1.

<sup>82</sup> Anjani Soni Wadhwa, 'The Personal Data Protection Bill, 2018' (*Mondaq*, 1 November 2018) <<http://www.mondaq.com/india/x/750792/Data+Protection+Privacy/The+Personal+Data+Protection+Bill+2018>> accessed 8 December 2018.

<sup>83</sup> Personal Data Protection Bill 2018, cl 69.

<sup>84</sup> James Halt, 'Where is the Privacy in WADA's "Whereabouts" Rule?' (2009) 20 *Marquette Sports Law Review* 267, 268.

<sup>85</sup> Mario Zorzoli, 'Biological Passport Parameters' (2011) 6 (2) *Journal of Human Sport and Exercise* 205.

<sup>86</sup> *ibid.*

<sup>87</sup> 'Athlete Biological Passport' (*World Anti-Doping Agency*) <<http://www.wada-ama.org/en/questions-answers/athlete-biological-passport>> accessed 10 December 2018.

<sup>88</sup> Fabian Sanchis Gomar and others, 'Current Limitations of the Athlete's Biological Passport Use in Sports' (*ResearchGate*, May 2011) <[http://www.researchgate.net/profile/Fabian\\_SanchisGmar/publication/51171787\\_Current\\_limitations\\_of\\_the\\_Athlete%27s\\_Biological\\_Passport\\_use\\_in\\_sports/links/54c2f0380cf219bbe4e9e834/Current-limitations-of-the-Athletes-Biological-Passport-use-in-sports.pdf](http://www.researchgate.net/profile/Fabian_SanchisGmar/publication/51171787_Current_limitations_of_the_Athlete%27s_Biological_Passport_use_in_sports/links/54c2f0380cf219bbe4e9e834/Current-limitations-of-the-Athletes-Biological-Passport-use-in-sports.pdf)> accessed 10 December 2018.

<sup>89</sup> World Anti-Doping Agency, 'International Standard for the Protection of Privacy and Personal Information 2015' (*World Anti-Doping Agency*, January 2015) <<http://www.wada-ama.org/sites/default/files/resources/files/WADA-2015-ISPPPI-Final-EN.pdf>> accessed 10 December 2018.

<sup>90</sup> *ibid.*

<sup>91</sup> International Standard for the Protection of Privacy and Personal Information 2015, art 14.

<sup>92</sup> Zorzoli (n 131).

<sup>93</sup> Matt Slater, 'Has the Biological Passport Delivered Clean or Confused Sport?' (*BBC Sport*, 12 November 2014) <<http://www.bbc.com/sport/cycling/29959937>> accessed 17 December 2018.

<sup>94</sup> 'UKAD Confirms Two Year Ban for Professional Cyclist' (*UK Anti Doping*, 18 August 2014) <<http://www.ukad.org.uk/news/article/ukad-confirms-two-year-ban-for-professional-cyclist/>> accessed 13 December 2018.

<sup>95</sup> *UK Anti-Doping v. Jonathan Tiernan Locke* (2014) National Anti-Doping Panel SR/0000120108.

<sup>96</sup> William Fotheringham, 'Jonathan Tiernan-Locke banned for two years and sacked by Sky' (*The Guardian*, 17 July 2016) <<http://www.theguardian.com/sport/2014/jul/17/jonathan-tiernan-locke-ban-sacked-team-sky-cycling>> accessed 13 December 2018.

<sup>97</sup> *Franco Pellizotti v. CONI and UCI* TAS 2010/A/2308; *UCI v. Pellizotti FCI and CONI* TAS 2011/A/2335.

<sup>98</sup> *ibid.*

<sup>99</sup> *ibid.*

<sup>100</sup> *UCI v. Alberto Contador and RFEC* CAS 2011/A/2384; *WADA v. Alberto Contador and RFEC* CAS 2011/A/2386.

<sup>101</sup> *ibid.*

<sup>102</sup> Laura Hall, 'A Speedo-NASA Partnership After the 2004 Olympics Resulted in a Swimsuit Worthy of World Records' (NASA, 31 October 2012) <[http://www.nasa.gov/offices/oct/home/tech\\_record\\_breaking.html](http://www.nasa.gov/offices/oct/home/tech_record_breaking.html)> accessed 3 December 2018.

<sup>103</sup> *ibid.*

<sup>104</sup> Amber Lee, 'Technology Doping in the Olympics' (*Breaking Muscle*) <<http://www.breakingmuscle.com/learn/technology-doping-in-the-olympics-cheating-or-progress>> accessed 4 December, 2018.

<sup>105</sup> Krushell (n 50).

<sup>106</sup> *ibid.*

<sup>107</sup> Britannica Editors, 'The Amazing Rise and Fall of Performance-Enhancing High Tech Swimsuits' (*Britannica Blog*, 10 February 2010) <<http://www.blogs.britannica.com/2010/02/performance-enhancing-high-tech-swimsuits/>> accessed 3 December 2018.

<sup>108</sup> Jon Bardin, 'Is Technological Doping the Strongest Force in the Olympics?' *Los Angeles Times* (California, 24 July 2012) <<https://latimes.com/science/la-xpm-2012-jul-24-la-sci-sn-is-technological-doping-the-strongest-force-in-the-olympics-20120724-story.html>> accessed 8 December 2018.

<sup>109</sup> 'Technology in Sport: Competitive Edge or Unfair Advantage' (*PDD Innovation*, 13 February 2012) <<http://www.pddinnovation.com/blog/2012/07/technology-in-sport-competitive-edge-or-unfair-advantage/>> accessed 7 December 2018.

<sup>110</sup> *Australian Olympic Committee* (Advisory Opinion) CAS 2000/C/267.

<sup>111</sup> Fédération Internationale De Natation Swimming Rules 2017, SW 10.

<sup>112</sup> *Amaury Leveaux and Aurore Mongel v. Fédération Internationale de Natation* CAS 2009/A/1917.

<sup>113</sup> *ibid.*

<sup>114</sup> *ibid.*

<sup>115</sup> Bardin (n 154).

<sup>116</sup> Nick Legan, 'You Can Build a Bionic Cycle' (*BBC*, 7 July 2016) <<http://www.bbc.com/autos/story/20160707-you-can-build-a-bionic-bicycle>> accessed 19 December 2018.

<sup>117</sup> Stuart Clarke, 'Everything You Need to Know about the Motorised Doping Scandal' (*Cycling Weekly*, 22 April 2016) <<http://www.cyclingweekly.com/cycling-weekly/everything-you-need-to-know-about-the-motorised-doping-scandal-209635>> accessed 7 December 2018.

<sup>118</sup> Nigel Wynn, 'Fresh 'Motorised Doping' Claims as Ryder Hesjedal's Bike Moves on its Own' (*Cycling Weekly*, 4 September 2014) <<http://www.cyclingweekly.com/news/latest-news/fresh-motorised-doping-claims-ryder-hesjedals-bike-moves-134745>> accessed 11 December 2018.

<sup>119</sup> Peter Stuart, 'Motor Doping is Happening, and We've Tested it' (*Cyclist*, 24 November 2017) <<http://www.cyclist.co.uk/news/542/motor-doping-is-happening-and-weve-tested-it>> accessed 18 December 2018.

<sup>120</sup> *ibid.*

<sup>121</sup> Clarification Guide of the UCI Technical Regulation 2014, art 1.3.010.

<sup>122</sup> Sarah Boseley, 'London 2012 Olympics: How Athletes Use Technology to Win Medals' (*The Guardian*, 4 July 2012) <<http://www.theguardian.com/sport/2012/jul/04/london-2012-olympic-games-sport-technology>> accessed 16 December 2018.

<sup>123</sup> Competitive (n 155).

<sup>124</sup> Andy Miah, 'Rethinking Enhancement in Sport' (2007) 1093 (1) *Annals of the New York Academy of Sciences* 301, 308.

<sup>125</sup> *ibid.*

<sup>126</sup> Gary Mihoces, 'More Padding the Issue of Concussions and Better Helmets' (*USA Today Sports*, 30 July 2013) <<http://www.usatoday.com/story/sports/ncaaf/2013/07/30/concussions-college-football-nfl-guardian-caps/2601063/>> accessed 18 December 2018.

<sup>127</sup> Vongni Yang, 'Guardian Caps Reducing Head Injuries for Pioneers' (*Visalia Times Delta*, 13 October 2015) <<http://www.visaliatimesdelta.com/story/sports/high-school/football/2015/10/14/guardian-caps-reducing-head-injuries-pioneers/73912558/>> accessed 15 December 2018.

<sup>128</sup> Unequal Technologies, 'Unequal Technologies Debuts the Latest Innovation in Supplemental Head Padding' (*Cision PR Newswire*, 3 April 2013) <<http://www.prnewswire.com/news-releases/unequal-technologies-debuts-the-latest-innovation-in-supplemental-head-padding-201238441.html>> accessed 4 December 2018.

<sup>129</sup> Bryce Dyer, 'The Controversy of Sports Technology: A Systematic Review' (2015) 4 *Springer Plus* 1, 1.

<sup>130</sup> Brendan Burkett, Mike McNameeb and Wolfgang Potthastc, 'Shifting Boundaries in Sports Technology and Disability: Equal Rights or Unfair Advantage in the Case of Oscar Pistorius?' (2011) 26 *Disability and Society* 634, 649.

<sup>131</sup> *ibid.*

<sup>132</sup> Wray Vamplew, 'Playing with the Rules: Influences on the Development of Regulation in Sport' (2007) 24 *International Journal of the History of Sport* 843, 855.

<sup>133</sup> Bryce Dyer and others, 'The Fair Use of Lower-Limb Running Prostheses: A Delphi Study' (2011) 28 (1) *APAQ* 16, 17.

<sup>134</sup> Bryce Dyer (n 175).

<sup>135</sup> *ibid.*

<sup>136</sup> Brendan Burkett (n 176).

<sup>137</sup> Stuart Miller, 'Should Prosthetics be Allowed in Non-Amputee Events?' (*UKSportSci*, 26 November 2012) <<http://www.uksportsci.wordpress.com/2012/11/26/prosthetics-in-sport/comment-page-1/>> accessed 15 December 2018.

<sup>138</sup> *Pistorius v. IAAF CAS 2008/A/1480.*

<sup>139</sup> *ibid.*

<sup>140</sup> *ibid.*

<sup>141</sup> Larry Greenemeier, 'Blade Runners: Do High-Tech Prostheses Give Runners an Unfair Advantage?' (*Scientific American*, 5 August 2016) <<http://www.scientificamerican.com/article/blade-runners-do-high-tech-prostheses-give-runners-an-unfair-advantage/>> accessed 4 December 2018.

<sup>142</sup> Garrett Ross, 'Technology at Paralympics Sparks Advances and Controversy' (*Phys Org*, 17 September 2016) <<https://phys.org/news/2016-09-technology-paralympics-advances-controversy.html>> accessed 15 December 2018.

<sup>143</sup> Joe Lemire, 'Tech Doping: How Paralympic Sprinters Game the System' (*Vocativ*, 8 September 2016)

<<http://www.vocativ.com/354886/tech-doping-how-paralympic-sprinters-game-the-system/?wpsrc=theweek>>  
accessed 16 December 2018.

<sup>144</sup> Sigmund Loland, 'The Ethics of Performance-Enhancing Technology in Sport' (2009) 36 *Journal of the Philosophy of Sport* 152, 159.

<sup>145</sup> *ibid.*

<sup>146</sup> Giuseppe Lippi, Massimo Franchini and Gian Cesare Guidi, 'Prohibition of Artificial Hypoxic Environments in Sports: Health Risks Rather Than Ethics' (2007) 32 *Applied Physiology, Nutrition, and Metabolism* 1206.

<sup>147</sup> *ibid.*

<sup>148</sup> *ibid.*

<sup>149</sup> David James, 'The Ethics of Using Engineering to Enhance Athletic Performance' (2010) 2 *Procedia Engineering* 3405, 3407.

<sup>150</sup> Verner Møller, *The Ethics of Doping and Anti-Doping: Redeeming the Soul of Sport?* (Routledge 2010) 108.

<sup>151</sup> Merle Spriggs, 'Hypoxic Air Machines: Performance Enhancement Through Effective Training—Or Cheating?' (2005) 31 (2) *Journal of Medical Ethics* 112.

<sup>152</sup> Torbjorn Tannsjo, 'Hypoxic Air Machines: Commentary' (2005) 31 (2) *Journal of Medical Ethics* 113.

<sup>153</sup> Miah (n 170) 315.

<sup>154</sup> James A.R. Nafziger, 'Avoiding and Resolving Disputes During Sports Competition: Of Cameras and Computers' (2007) 15 (1) *Marquette Sports Law Review* 13, 26.

<sup>155</sup> Jen Booton, 'NHL Smart Puck Will Bring Big Data to the Ice' (*SportTechie*, 22 May 2018) <<http://www.sporttechie.com/nhl-smart-puck-will-track-200-times-per-second/>> accessed 15 December 2018.

<sup>156</sup> Jen Booton, 'Digilens Unveils New Augmented Reality Helmet for Bikers' (*SportTechie*, 23 May 2018) <<https://www.sporttechie.com/digilens-unveils-new-augmented-reality-helmet-for-cyclists/>> accessed 15 December 2018.

<sup>157</sup> Jen Booton, 'Australian Sports Anti-Doping Authority Can Hack Athlete Phones' (*SportTechie*, 23 May 2018) <<http://www.sporttechie.com/asada-australian-sports-anti-doping-authority-can-hack-athlete-phones/>> accessed 18 December 2018.

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